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Month.	Direction of Wind.	Duration in Days.	Thermometer.			Remarks.
			Max.	Min.	Average.	
			°	°	°	
January -	North to north-west.	17	47	15	20 to 34	One northerly gale of short duration. Force, 7 to 9, and accompanied by passing showers of snow. Snow fell on 12 days, the remainder of the month being generally bright and clear.
	Easterly - -	1				
	South to west -	9				
	Calm and variable	4				
February -	North to east -	1	59	17	24 to 45	One northerly gale, lasting 12 hours. Force, 6 to 8. Several strong breezes from the northward and westward. Snow fell on 3 days, remainder of month bright, clear, and bracing.
	South to east -	2				
	South to west -	4				
	North to west -	15				
	Calm and variable	6				
March -	North to east -	4	70	28	40 to 57	One southerly gale, lasting 5 hours. Force, 7 to 9, and two or three strong breezes. Rain fell 2 days. Remainder of the month chiefly bright and clear.
	South to west -	9				
	North to west -	11				
	Calm and variable	7				
April -	South to east -	10	80	46	46 to 61	Three strong northerly, and two southerly breezes, of short duration, with a force of from 5 to 7. Rain fell during 6 days. Fog 1 day. Weather more overcast and gloomy and damper than in previous months.
	South to west -	7				
	North to west -	7				
	Calm and variable	6				
May -	North-east to south-east.	10	84	47	55 to 70	One south-westerly gale; force, 6 to 8; and three strong westerly and north-westerly breezes; force, 4 to 5. Rain fell on 4 days, and the weather was generally cloudy and unsettled.
	South to west -	5				
	North and north-westerly.	9				
	Calm and variable	7				
June -	Easterly - -	16	87	59	67 to 78	No strong breezes this month. Weather generally fine and hot. Rain fell on 5 days, with one thunder storm, and one fog.
	Southerly - -	10				
	Northerly and westerly.	2				
	Calm and variable	2				
July -	South-easterly -	9	90	66	78 to 86	Three heavy thunder storms, accompanied by heavy squalls of rain, from S.W. to N.W. Rain fell on 6 days. There were two fogs, one being very dense, and accompanied by heavy rain.
	South and south-westerly.	9				
	North and north-westerly.	5				
	Calm and variable	8				
[illegible]	[illegible]	[illegible]				The strongest wind this month was from the north; [illegible] to 5. Rain fell on [illegible] always with an [illegible] wind. Thunder [illegible]n three successive [illegible], accompanied by [illegible]nd violent squalls [illegible]and rain from S.W. [illegible].
[illegible]	North-west to south-west.	4	91	60	69 to 83	[illegible]during 4 days, and [illegible]s complete absence of fog or thunderstorm, the weather being generally bright and clear.
	Calm and variable	10				

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THE

CHINA SEA DIRECTORY.

VOL. III.

COMPRISING

THE COASTS OF CHINA FROM HONG KONG TO THE KOREA;

NORTH COAST OF LUZON, FORMOSA ISLAND AND STRAIT;

THE BABUYAN, BASHEE, AND MEIACO SIMA GROUPS.

YELLOW SEA, GULFS OF PE-CHILI AND LIAU-TUNG.

ALSO THE

RIVERS CANTON, WEST, MIN, YUNG, YANGTSE, YELLOW, PEI HO, AND LIAU HO: AND PRATAS ISLAND.

SECOND EDITION.

FORD

COMPILED FROM VARIOUS SOURCES

BY

CAPTAIN CHARLES J. BULLOCK, R.N., F.R.G.S.

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ADVERTISEMENT TO SECOND EDITION.

THE China Sea Directory, Vol. III., contains Directions for the coasts of China; including on the south, Hong Kong, Canton river, Pratas shoal, the north coast of Luzon; Bashee; and Ballintang channels, Formosa and the outlying islands; on the north, the Yellow sea and gulfs of Pe-chili and Liau-tung, to the confines of the Korea.

The information has been obtained from the following sources:—

Canton river with approaches from surveys made in H.M. ships "Sulphur," "Actæon," and "Dove" between 1840 and 1859, with additions from various authorities to 1884.

The coast and outlying islets between Hong Kong and the Yang-tse kiang, including the Chusan archipelago, and Pescadores islands, are chiefly from the surveys of Captains Kellett and Collinson, C.B., R.N., 1842–46; with re-surveys of the principal ports, anchorages, and main navigable channels made in H.M. ships to 1883.

Formosa and its adjacent islands are from surveys executed in H.M. ships between 1845 and 1866, supplemented by additions from Officers of Her Majesty's Navy and Consular service, also from Chinese Imperial authorities to 1883.

The Yang-tse kiang from its entrance to Wusung inner bar is from the survey of Captain Napier, 1879–80; with later corrections to 1883. From Wusung to Hankau, the shore line of the river was originally charted by Captains Kellett and Collinson, 1842, and Commander J. Ward, 1858: the soundings and numerous tidal observations are principally from examinations made by Mr. G. Mobsby, Yang-tse Pilot, 1877–80. From Hankau to Yoh-chau-fu is from Commander J. Ward's survey of 1861. The upper Yang-tse to Kwei-chau-fu is by Sub-Lieutenant L. S. Dawson, R.N., 1869.

Northward of the Yang-tse kiang to the parallel of 35° North, the Coast and its sea board approaches are still imperfectly charted.

The western shores of the Yellow Sea, and gulfs of Pe-chili and Liau-tung are from surveys made in H.M. ships "Actæon," "Dove," and "Swallow," in the years 1857 to 1866: the northern portion of the Yellow Sea is now (1884) but little known.

The present edition has been revised by Captain R. H. Napier, R.N., who has added much from his personal knowledge. Notices to Mariners issued by the Chinese Government; the remark books of H.M. ships, and other documents in the Hydrographic Office have also contributed much valuable information.

Seamen are invited to transmit to the Secretary of the Admiralty notice of any errors or omissions they may discover or additional information they may obtain with a view to the improvement of this book and for the benefit of the mariner.

W. J. L. W.

Hydrographic Office, Admiralty, London,
October 1884.

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PRINCIPAL AUTHORITIES.

Captain Sir E. BELCHER, R.N.	1840–45.
Captain KELLETT, R.N. Captain COLLINSON, R.N.	1842–46.
Lieutenant GORDON, R.N.	1847.
J. RICHARDS, Master R.N.	1854–58.
Captain BATE, R.N.	1857.
Commander J. WARD, R.N. Lieutenant BULLOCK, R.N. J. H. KERR, Master R.N. W. BLAKENEY, Paymaster R.N.	1857–61.
E. WILDS, Master R.N. G. STANLEY, Master R.N.	1862–66.
Commander BROOKER, R.N.	1867–68.
Sub-Lieutenant DAWSON, R.N.	1869.
Mr. G. MOBSBY, Yang-tse Pilot	1877–80.
Captain NAPIER, R.N.	1877–81.

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THE DISTANCES ARE EXPRESSED IN SEA MILES OF 60 TO A DEGREE OF LATITUDE.

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THE SOUNDINGS ARE REDUCED TO LOW WATER OF ORDINARY SPRING TIDES.

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Chinese Words of Frequent Occurrence

IN THE

Charts and Sailing Directions.

Chinese.	*English.*
Chah	Barrier.
Chah-hwang-muh	Boom.
Chau	District city, islet.
Chin	Town.
Chow-Chow	Rippling of water.
Chuen	Channel.
Chung yuen	Mainland.
Fau-fu	Buoy.
Fau-tau	Roadstead.
Fu	Departmental city.
Gau	Harbour.
Hai	Sea.
Hai-kau	Bight, creek.
Hai-kioh	Cape.
Hai-mun	Estuary.
Hai-yau	Gulf.
Heh	Black.
Hiah-kau	Strait.
Hiang-tsun	Village.
Hien, Chau	District city.
Ho	River.
Ho-tun	Lighthouse.
Hu	Lake.
Hung	Red.
Hwang	Yellow.
I	Barbarian.
Kau	Mouth.
Kiang	River.
Kiau	Bridge.
Kin	Gold.
King	Capital city.
King-chi-chau	Peninsula.
Koh	Rocky peak, headland.
Kwang-lau	Lighthouse
Kwan	Custom-house.
Kuh	Valley.
Lau	Tower, old.
Li	Inner, also $\frac{1}{3}$ of a mile.
Lin	Forest.
Ling	Chain of hills.
Lung	Tiger.
Ma	Horse.
Ma-tau	Jetty, port.
Miau	Temple.
Nan	South, southern.
Ni	Mud.
Nui	Inner.
Pau-tai	Fort.
Peh, pei	North.
Peh	White.
Po, Hu	Lake.
Pu	Sea-shop.
Pwang-sheh	Rocks.
Sha	Sand, Sand-bank.
Shan, san	Hill, mountain.
Shan-hu	Coral.
Shan-ting	Mountain chain.
Shan-tau	Bluff, cliff.
Sha-sien	Shoal.
Sha-tan	Bar.
Sheh	Stone.
Sheh-tan	Reef.
Shin	Spirit (Celestial).
Shui	Water.
Si	West, Western.
Siau-ho	Rivulet.
Sima (Japanese)	Island.
Siwo („)	Current.
So	Town, village.
Tah	Pagoda.
Tau	Island, head.
Tau-tu	Clay.
Ting, Ti-tau	Promontory.
To-muh	Wooded.
Tsiau-pi	Cliff.
Tsui-sha	Gravel.
Tsui-wei	Rocky, stony.
Túng	East, eastern.
Tutan	Ferry.
Wan	Bay.
Wi-moh-ti	Isthmus.
Wei	Outer.
Wei	Military post.
Yang	Sheep.
Yen-tun	Beacon, buoy.

Note.—The vowels are sounded as in the continental pronunciation of Latin; or as in the following English words;—*a*, as *a* in father; *e*, as *ay* in say; *i*, as *ee* in meet; *o*, as *o* in more; and *u*, as *oo* in fool. *i* and *u* are often almost inaudible; in such cases they are written *ĭ*, *ŭ*; *au*, *ou*, and *oo* are written *ō* (long). The consonants are pronounced as in English.

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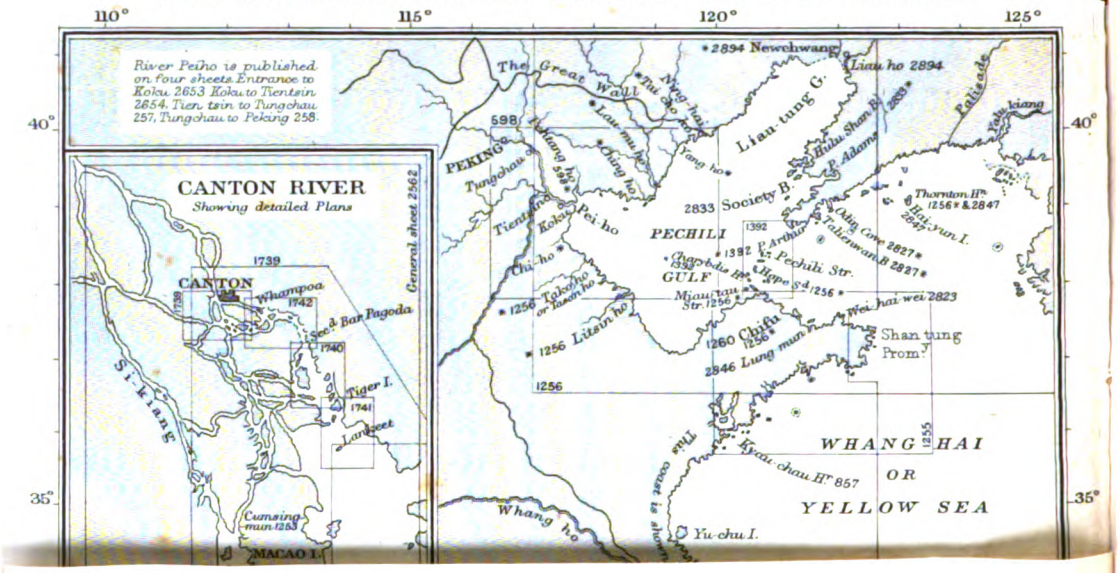

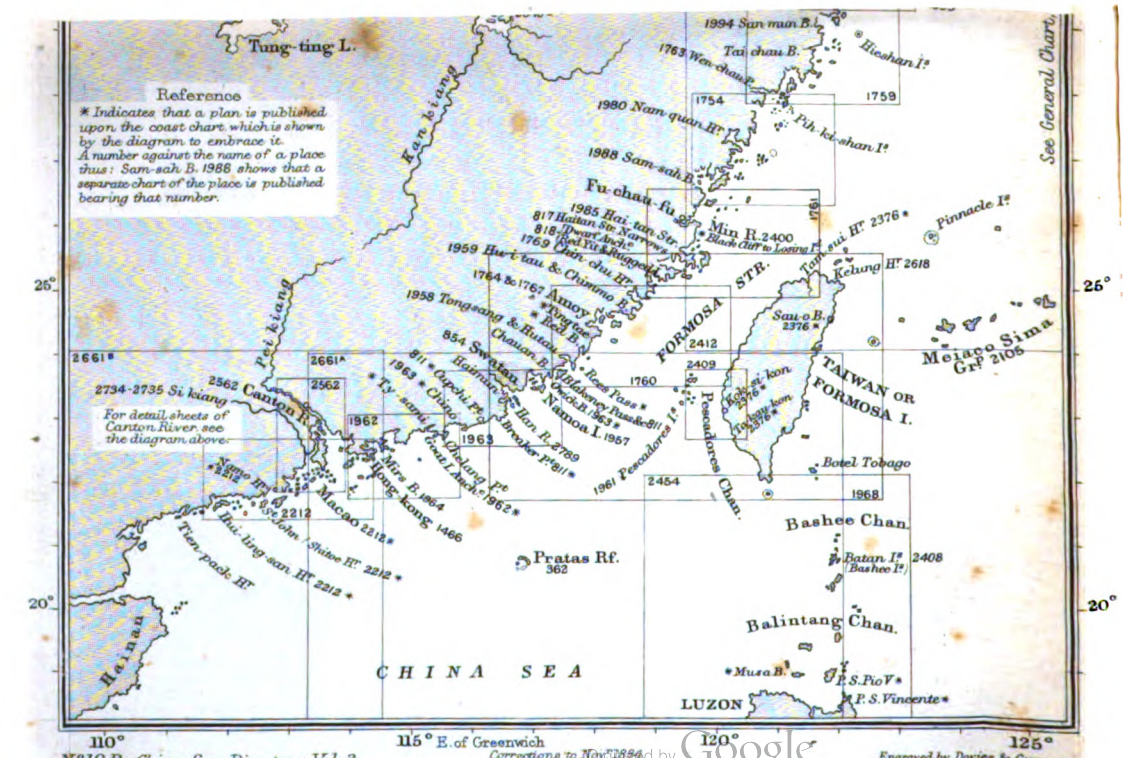

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THE

CHINA SEA DIRECTORY.

VOL. III.

CHAPTER I.

NAVIGATION.

MONSOONS, PREVAILING WINDS AND WEATHER, TYPHOONS, GALES, CURRENTS AND TIDES IN CHINA SEA AND ON THE COASTS OF CHINA AND FORMOSA; ALSO DIRECTIONS FOR MAKING PASSAGES.

WINDS AND WEATHER.

THE southern portion of the region which comes under description in this volume is within the influences of the periodic winds called the N.E. and S.W. monsoons, the former of which prevails from October to April, and the latter from May to September. Its proper geographical situation is in the N.E. trades, but during the summer season there is a complete reversal of the trade-wind, and the S.W. monsoon occurs. The N.E. wind is the more steady of the two, both in force and duration, and north of Formosa, where the trade-wind of the Pacific finds little obstruction, it prevails for nearly nine months of the year. The S.W. monsoon is regular in the China sea, but northward of Hong Kong it seldom blows with intensity for a longer period than three months, viz., June, July, and August; still during this period it prevails more or less over all the coasts of China, Tartary, and Japan, reaching almost to the Bonin islands and nearly 1,500 miles eastward of the Philipine islands, beyond the Marianas. It may therefore be said that in the northern part of China, which is without the limits of the N.E. trade-wind, the influences of the monsoons prevail, and the periods of northerly and southerly winds are the same as those of the monsoons, though they are much diminished in regularity, and broken by calms and variables, in the summer season especially.

The following remarks on the monsoons are taken from the Admiralty wind and current charts:—"China Sea.—In April, change of monsoon,

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with calms and light variable N.E. and S.E. winds. In May, light S.W. monsoon on Asiatic side; N.E. and S.E. winds in the centre, eastern and northern parts. In June, monsoon strong and steady. In September the monsoon falls light and variable, with fresh squalls from the southward, shifting to N.W., and blowing violently with rain on the coasts of Borneo and Palawan. In October, N.E. monsoon sets in fresh and steady in northern parts,* light with calms and S.W. squalls south of parallel of 13° N. In November and December, monsoon strong, but calms, variables, and rains experienced on eastern side."†

The NORTH-EAST MONSOON usually begins in the northern part of the China sea about the end of September or early in October; but in the southern part it seldom blows steadily till November; light southern or variable breezes prevailing the greater part of October. This monsoon generally sets in with a gale, which sometimes comes down without warning, and with a violence that has exposed several vessels to great danger; therefore, when the monsoon is about to change, they should avoid anchoring in exposed positions, and weigh instantly if the wind freshen, as the swell rises so quickly as to cause a difficulty in getting the anchor. The first burst of the monsoon frequently lasts a week or ten days. The weather in some years is settled and fine during September and October; but the period of the autumnal equinox is a very precarious one, for within a few days of it storms are very likely to occur.

In November the N.E. monsoon prevails generally; but it blows more steadily, and with greater strength, in December and January. The weather in these months is frequently cloudy, with much rain and a turbulent sea, particularly southward of Pulo Sapata; there are also considerable intervals of fine weather. On the coast of Palawan (*see* vol. ii.) the winds are variable in October, November, and the early part of December, by which vessels pass along that coast either to the north-east or south-west, but the weather is often dark, rainy, and cloudy. On the coast of Luzon (pages 5 and 6) the winds are frequently variable during this monsoon, generally from the northward and north-east; but they veer to the north-west and westward at times, and then blow strong, with cloudy weather and rain. In the gulf of Tong King, in November, there are sometimes faint land breezes close to the coast; but the N.E. monsoon prevails along the coast of Cochin China, as far southward as cape Padaran, generally

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* Except on coast of Luzon. On the 29th October 1870 it was calm off cape Bojeador.

† *See* Admiralty Atlas :—Wind and Current Charts for the Pacific, Atlantic and Indian ocean.

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from September or the early part of October, to the beginning or middle of April. *See* also vol. ii., chapter 1.

In February, according to Horsburg,* the strength of the N.E. monsoon abates. During this month and March it blows moderately, with steady weather all over the China sea, inclining to land and sea breezes on the coast of Luzon. In the northern part of China sea, April is regarded as the finest month, and May a period of alternating N.E. and S.W. breezes.

On the southern coast of China, when the N.E. monsoon prevails, the winds blows mostly from E.N.E. parallel to the shore; they veer, and blow off the land at times, and also from the south-east, but there are seldom any regular land or sea breezes on that coast. On the eastern coast, between Macao and Chusan, the monsoon is at its height from November to January. In October, November, and December the weather is tolerably fine. From January to March a great deal of cloud and fog hang about. In April the monsoon loses strength for a day or two; sometimes the wind changes to south, when the weather becomes thick, and squalls follow from N.E. till the middle of May.

On the eastern coast of China in the N.E. monsoon, strong gales, with rising barometer, are frequently experienced; and a low barometer in the same season will generally be found to indicate a southerly wind. At Wusung the barometer has differed in some years as much as an inch during the two monsoons. The mean barometer from October 1847 to March 1848 was 30·33; while from April to September 1848 it was only 29·53. During the height of the monsoon the wind at night will be found frequently to draw off the land all along the east coast, affording an opportunity for a vessel to make a good board in the middle watch.

General remarks.—The following is from the remarks of Captain R.H. Napier, R.N.† "The N.E. monsoon (which is generally ushered in with a fierce gale) sometimes commences as early as the last week in August, and blows (with a varying force of from 5 to 7) to the end of April.

"It is accompanied by occasional straight N.E. gales, the strongest seas and winds being experienced in the Formosa Channel.

* Staff-Commander John W. Reed, R.N., observes, "From my own experience, and from inquiries made of many captains accustomed to the navigation of the China sea, I am of opinion that strong winds and unsettled weather will generally be experienced during the month of February, and that moderate breezes and settled weather are exceptional in that month."

† Commanding H.M. Surveying vessels *Nassau* and *Magpie*, from 1876 to 1881.

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"Steamers should hug the shore as closely as safety permits, and follow the bends and indentations of the coast, as smoother water will thereby be obtained, and the monsoon does not usually "blow home," or with as great force as farther to seaward. The wind generally veers round to the northward (and sometimes even to the north-westward) in the very early morning; and becomes lighter at night, and in the forenoon, than at other times.

"There is usually a surface current of from 1 to 2 knots per hour setting to the southward during the adverse monsoon, and an easterly (and sometimes even south-easterly) swell will often be experienced, this being more apparent in the bays, from the heaping up of the waters, at the turn of the headlands and points; when rounding these, great caution is required, on account of the strong tide rips, which, from their seething, may easily be mistaken by a stranger for broken water.

"Fair anchorage can be obtained at convenient distances along the coast. (*See* Appendix.)"

The SOUTH-WEST MONSOON generally commences in the China sea about the middle or end of April, and continues to the beginning or middle of October, liable to an acceleration or retardation of twelve or fifteen days. It sets in rather sooner about the gulfs of Siam and Tong King and along the western coasts than in the open sea, or near the coasts of China, Palawan, and Luzon. It is also of longer continuance southward of the parallel of 11° N. than in the northern part of the sea, where it generally terminates about the first week in September; for whilst N.E. and easterly winds are blowing on the China coast, southerly winds frequently prevail between Singapore and Pulo Sapatu until the middle of October, although more often, about Pulo Sapatu, light northerly and variable winds and calms prevail at this period.

In May the winds are often light and variable in the open sea, and easterly or S.E. winds are likely to happen for a day or two at a time during the whole of the S.W. monsoon, particularly in the northern part of the China sea, where these winds are frequently experienced in both monsoons.

The S.W. monsoon is at its greatest strength, and least liable to change, in June, July, and August, at which period there is at times much rain and cloudy weather all over the China sea; in these months, and also in May, sudden hard squalls blow sometimes out of the gulf of Siam,* as far as Pulo Condore and Pulo Sapata. Whenever dense clouds are perceived to rise, indicating the approach of these squalls, sail ought to be reduced without delay.

* For wind and weather in gulf of Siam, *see* China Sea Directory, vol. ii.

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During the height of the monsoon the wind draws southward, varying from S.S.W. to S.S.E. in June and July.

From the gulf of Siam to cape Padaran the S.W. monsoon blows nearly parallel to the coast; and, if close in, a light wind from the land is at times experienced at night, succeeded by a short interval of calm on the following morning. The monsoon breeze then sets in and generally continues brisk during the day. These land and sea breezes prevail most on the coast of Cochin China, from cape Padaran northward to the gulf of Tong King; for the sea wind dies away almost every evening on this coast during this monsoon, and a land breeze comes off in the night, although not at a regular hour. This is followed by calms or light airs, which frequently continue until noon; the sea breeze then sets in from the south-east.

In March and April there are lands and sea breezes on the coast of Luzon, with fine weather; but after the S.W. monsoon sets in strong in June, and from that time until it abates in October, the weather is mostly cloudy, and the winds blowing from the sea upon that coast are generally accompanied with much rain.

On the coasts of China, both monsoons are subject generally to the same variations as those in the China sea. In the southerly monsoon the winds are not so constant from one quarter of the compass as they are in the N.E. monsoon; land and sea breezes occur near the coast, so that there is nothing like the difficulty in getting southward against the southerly monsoon that there is in getting northward against the N.E. monsoon. On the south coast the winds during the southerly monsoon prevail frequently at south and S.S.E. About Formosa, and also between it and the coast, strong north-east winds often happen in July, August, and September. (*See* pages 7 and 8.)

CAMBODIA.—On the coast of Cambodia, in June, July, and August there are heavy rains accompanying S.W. winds. The monsoons are not regular, and land and sea breezes are met with when the prevailing monsoon is weak. These breezes do not last more than five or six hours during the S.W. monsoon, and are not so fresh as those which prevail at the end of the N.E. monsoon. At Pulo Timoan and Pulo Condore the N.E. monsoon is established towards the middle of October with fine weather. The S.W. monsoon brings rain, and lasts during five months. Near the above islands, in November, there are alternately calms, and storms accompanied by rain or typhoons. At Pulo Condore the rains continue for a month after the N.E. monsoon is established. At Pulo Timoan the wind becomes unsettled in September, and the change of monsoon is attended by bad weather. In November the weather is fine. On the coast which extends between the gulf of Siam and cape Padaran

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the S.W. monsoon blows along the shore, and sometimes, near the land, during the night a light land breeze is found succeeded by an interval of calm, which is followed by the monsoon wind, blowing fresh during the remainder of the day. On the same coast the N.E. monsoon is established for the end of September or beginning of October to the middle of April.

COCHIN CHINA.—On this coast wintry weather is found with cold northerly winds and rain, which prevail from December to February. During the N.E. monsoon easterly winds are frequent. Between the Paracels and the coast as far as cape Varela easterly winds with frequent calms are found, whilst out in the China sea the monsoon is blowing fresh and regularly. During the S.W. monsoon on this coast the land and sea breezes are tolerably regular, the sea breeze being replaced by the land breeze every evening, which blows during the night, followed by a calm or light wind, which does not always commence at the same hour, but generally lasts till noon, when the sea breeze again sets in. The winds on the coast of Cochin China are variable during the whole year, and the monsoons generally light. The leeward coast is not dangerous with the N.E. monsoon. Heavy rains occur in September, October, and November.

NORTHERN COAST of LUZON and BASHEE CHANNEL.—The monsoons on the west coast of Luzon are so subject to interruption, being influenced by local circumstances and other causes, that it is difficult to say at what period either fairly sets in. The northern coast of Luzon lie in the main strength of the monsoons. Its mountains, which rise to the height of 6,000 feet, exert an important influence on the climate by intercepting the monsoons in their courses, and thereby cause the bad weather so often encountered near the coasts. At the changes of the monsoons gales and bad weather are not unfrequent, also typhoons. The seasons are divided into wet and dry. The S.W. monsoon brings often cloudy, gloomy, and wet weather on the western coasts, and the rains last from the beginning of June till the middle of September, whilst at that season there is fine weather in the eastern and northern parts of Luzon. In October the westerly monsoon gives place to the northerly winds, which bring similar rains from the Pacific, which are very abundant on the eastern coast. In February the N.E. monsoon abates, and in March becomes moderate, inclining to land and sea breezes, which have a tendency to follow the course of the monsoon, and not blow directly off and on the coast; and these are found on the west coast nearly as far north as cape Bojeador up to the end of December. On the north coast of Luzon, during the N.E. monsoon, the winds are frequently variable, generally from north and N.E., but if they veer to N.W. and West they then blow

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strong and are attended with cloudy weather and rain. In April the alternating land and sea breezes are well established, and from June to October, the period of the S.W. monsoon, that wind brings rain, and blows on the coast at right angles.

In the Bashee channel typhoons are liable to occur during the summer months, and sometimes also early in May, at which latter period they pass through to the north-eastward, having recurved in the central part of the China sea. Later in the season their course through these straits is generally between W.N.W. and W.S.W., but more often in the former direction. In November furious gusts are sometimes experienced. In the N.E. monsoon strong winds prevail.

EAST COAST of FORMOSA.—The N.E. monsoon is established on this coast in October and blows steadily until April, the wind being generally much more moderate near the shore than in the offing, but it is often very boisterous in the strength of the monsoon. It changes in April, but the S.W. monsoon seldom sets in until May, and S.E. winds prevail greatly up to July. Between June and September very fine weather is generally experienced, the southerly monsoon being a gentle breeze.

REGION N.E. of FORMOSA.—In June the S.W. monsoon is established, and blows as a light summer gale over the Luchu and Linschoten islands, with blue sky and fine weather. It sets in earlier, but the winds are light, and for the most part from south and S.E., excepting northward of a line joining Formosa and Luchu, where E.N.E. winds, generally fresh, prevail through May.

At the Meiaco Sima group the wind in April is variable between south and S.E., with unsettled weather. In May and June S.W. winds prevail, variable round to south. From July to September S.W. winds prevail, variable round to south and sometimes south-east. In September the monsoon changes, and unsettled weather is experienced during that month, and strong, variable winds with squalls and rain. From October to December, inclusive, the winds are strong from north and N.E., with haze or rain. In December there are constant strong winds, with much boisterous weather (*see* also p. 312). From January to March, inclusive, strong winds with haze and rain prevail, variable between North and East; and in March the monsoon moderates, and occasional calms are experienced.

Typhoons are experienced at the islands north-east of Formosa from July to October, inclusive, and sometimes in November.

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During the visit of the U.S. squadron to Luchu in 1854, the S.W. monsoon prevailed steadily in May and June, the wind veering to the southward and eastward in July. In August it was changeable, and at times strong with squalls and rain, the monsoon changing on 1st September.*

WEST COAST of FORMOSA.—From October to April the N.E. monsoon has for the most part the same character as on the China coast, fresh and varied with gales, although generally more moderate and fine on the southern part of the coast. The S.W. monsoon is greatly modified by the land of Formosa, and in the summer months gentle S.W. winds and calms prevail, the breeze blowing home to the coast but not beyond, with rarely a gale of even a few hours' duration. North of the Pescadores the S.W. winds do not set in till May, when they alternate with strong N.E. winds. On the north coast these alternating winds continue into June, the latter blowing very fresh and bringing in a remarkable black haze, characteristic of this coast during a north-easter. The wind at such times veers about between N.E. and N.N.W., continuing about three days; but whilst blowing hard outside they do not fetch home into Kelung harbour. The N.E. trade-wind may be said to blow on the northern coast nearly nine months in the year.

The northern coast is occasionally visited by typhoons, and the same may be said of the south-west coast of the island (*see* also page 9), for they have been recorded both at Takau and Taiwan fu.

The YELLOW SEA.—For winds and weather, *see* page 528.

The GULFS of PE-CHILI and LIAU-TUNG.—*See* pages 604 and 638.

THE EASTERN PASSAGES TO CHINA.—These will be found in the Appendix, page 680.

TYPHOONS.†—The Chinese word *typhoong*, signifying "great wind," has long by general consent been applied as a distinguishing appellation to those revolving storms which prevail in the China sea and the contiguous portion of the North Pacific ocean. These dangerous tempests occur in the northern part of the China sea, in the Bashee channel, eastward and westward of Formosa, on the west coast of the Korea; over the Philipine islands, and also between Formosa and Japan.

"They are most frequent at Manilla, in the vicinity of Hainan island, and off the S.W. corner of Japan. Amoy, Foochow (and the coast

* Perry's "Expedition to Japan."

† For account of remarkable typhoons, *see* Appendix, page 692. *See also* remarks on Revolving Storms, third edition, 1883.

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between those ports), enjoy a comparative immunity, but one or two a year are sure to find their way up the Formosa channel and cause danger to vessels trading in that region."

"Their direction is much affected by the N.E. monsoon, which frequently turns them into low latitudes, but they will not be met with south of the ninth parallel. When the N.E. monsoon has become well established down to that latitude they disappear entirely." Eastward of Formosa they extend as far as the Bonin islands, and probably right across the Pacific between the latitudes of 10° and 50° N. It is said that they blow with the greatest fury when near the land, and also that their violence is not so great when they pass well southward of the coast of China. In the China sea their limit is about 14° N. lat., although severe gales are sometimes experienced two or three degrees further southward.

Typhoon Seasons.—The general season of the typhoons is from July till November inclusive, but they have also occurred in June, and even as early as the beginning of May in the China sea.* They are of equal local severity in all the typhoon months. The September equinox is a very precarious period, particularly if the perigee of the moon coincide with the equinox; for when this has been the case, typhoons have happened several years at the equinox in September on the coast of China, and many ships have been dismasted on the 21st or 22nd of that month.

Law of Storms. — Typhoons are rotary storms, similar in character to those of the West Indies and Indian ocean, and follow the same laws of gyration and progression as all hurricanes in the northern hemisphere. The "Law of Storms," now so fully recognised and so well understood, should be the study of every navigator of these seas, because without a complete knowledge of the system which regulates the motions of a cyclone, the skill of the seaman is rendered futile, for if overtaken by the centre the vessel becomes unmanageable, and, left to the mercy of the storm, is liable to founder. It therefore behoves the mariner to master the subject so as to be ready for every emergency, and enable him to avoid damage or disaster.

The motions of a hurricane are two,—one rotatory, the other moving forward. It may be best described as a vast, progressive whirlwind. The storm itself may be regarded, for practical purposes, as circular in form,

* From a record of Typhoons in China extending over a period of 85 years, by Schück, Captain A., Die Wirbelstürme. In May there occurred 11, in June 10, July 22, August 40, September 58, October 35, November 16, December 6.

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with the wind moving in a circuit or spiral round the centre or vortex, where it is usually calm, with the wind revolving around it with uncontrollable fury, and diminishing gradually in force towards the circumference. The rotation of the wind in a typhoon is "against the sun," or "against the hands of a watch." Its rate of progress has been variously estimated,* the slower movements occur in the lower latitudes; its velocity is always retarded at the period of its recurvature: when this occurs in low latitudes (as in the Bashee channel), the rate of progress is as little as 45 miles a day. The bad effect of these storms are often felt at 150 miles from the centre. Phenomena indicating a typhoon will be noticed, from 300 to 800 miles from the centre, more especially in front of it on its path, for in that line, the heaviest swell is driven, and the barometer falls most rapidly.

Paths of Typhoons.—"As a rule typhoons commence immediately east of the Philipines, between latitude 10° and 20° north, whence they advance in courses between north and west. In *May* their paths are confined to the tropics. In *June* they trend towards Hainan island, over Hongkong and Swatow, or up the Formosa channel. In *July* they sweep in every direction between latitude 17° north and 32° north, but they do not extend to Japan until the end of the month. In *August* and *September* they become general.

"*September* is especially dangerous, both for the reasons mentioned on page 9, and owing to great irregularity of path caused by the north-east monsoon, which commences in the higher latitudes in fitful puffs. In *October* they are confined to the tropics by the north-east monsoon; but a few having their origin well eastward of the Philipines, will make for the south-east coast of Japan. In *November* they blow only between the parallels 9° to 14° north in the China sea; but, as in October, a few run north-eastward between Liu Kiu and the Bonin islands. In the central and northern parts of the China sea their course lies between N.W. by W. and W. by S.; those having much northing generally continuing overland and recurving into the gulf of Pechili. Those travelling between W. by N. and W. by S. usually break up inshore. Those that cross the north end of Luzon in the S.W. monsoon, either come through the Bashee channel and run up the China coast, or else run up the east coast of Formosa, and then hug the North China shore. Both these paths are dangerous, and are prolonged in a northerly course to the gulf of Pechili, or in a N.N.E. course to the north coast of Japan. Those that commence well to the eastward of

* Averaged at 200 miles a day. *See* Remarks on Revolving Storms (third edition, 1883). *See also* footnote at page 15.

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Formosa, usually travel north or N.W., for the S.W. point of Japan, and recurving to the northward of the Liu Kiu islands, play havoc along the south and east coasts."*

At no part of their progress is it so dangerous to meet a cyclone as during its recurvature, especially if it should be moving at a rapid rate or changing its course quickly, for great perplexity must in such a case arise as to the course of the storm, at a time when a prompt decision may be of the utmost importance. The most frequent point of recurvature is in latitude 28° north, on the China coast, and in latitudes 28° to 32° north, to the south of Japan.

As these great storms obey certain laws, it follows that the position and track of a typhoon may be determined approximately. The axis or central line of progression is called the storm-path, and divides the storm-field into two semicircles, called right and left, looking at the direction in which it is bodily moving; thus the right semicircle of a typhoon is the more northerly one. Each semicircle has two quadrants, one preceding or leading, one lying behind or following, the storm's centre. Now, by observing the direction of the wind it is easy to ascertain the ship's position in the storm-field by the following rule:— Look at the wind's eye, note its direction, and the eighth point to the right is the bearing of the centre of the storm; thus, if the wind be N.E. the storm's centre is S.E.† Next, by observing in which direction the wind veers, the approximate course of the storm-path may be determined. To make an accurate mental deduction the ship should be stationary. A good method is to project on the chart, if the scale be large enough, or otherwise on a sheet of paper, the positions of ship and vortex about 50 miles apart, marking off the ship's track and the varying position of the vortex, and making an allowance of about four miles decrease of distance for every tenth of an inch that the barometer falls.‡ By adopting this graphic method the perplexities arising from apparent anomalies due to the separate motions of ship and storm may be obviated. For instance, if a ship were running in the same direction as a typhoon, but overtaking it; the wind would be found to veer in a direction the very opposite of that which it would have done had she been hove-to; and an erroneous conclusion might be drawn from this circumstance regarding her position in the storm-field and the proper steps to be taken.

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* Lieut. Carpenter, R.N., 1882.

† It should be borne in mind that in *some* cases the bearing of the centre *may* be as much as 10 or even 12 points from the direction of the wind. *See* Remarks on Revolving Storms, third edition; footnote, page 8; and Appendix, pages 32, 34, and 35. *Also* Appendix to this work, pages 695 and 696.

‡ *See* footnote, page 13.

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Practical Observations.—The following table, taken from Professor Dove's "Law of Storms" (second edition, p. 290), exhibits how a ship should be handled under most circumstances on meeting a typhoon, observing that it is only possible for a vessel to run where she has sea room. (*See also* pages 695, 696, and foot note at page 11.)

(1.)	Direction of Wind at the beginning of Storm. (2.)	Bearing of Centre from Ship. (3.)	If the Shift of Wind be from (4.)	Then steer (5.)		If the Shift of Wind be from (6.)	(7.) Then
1	N.W.	N.E.	N.W. towards W.	S.E.	Or else, heave the ship to on the Port tack.	N.W. towards N.	Heave-to on the Starboard tack.
2	N.W. by N.	N.E. by E.	N.W. by N. „ W.	S.E. by S.		N.W. by N. „ N.	
3	N.N.W.	E.N.E.	N.N.W. „ W.	S.S.E.		N.N.W. „ N.	
4	N. by W.	E. by N.	N. by W. „ W.	S. by E.		N. by W. „ N.	
5	North.	East.	North „ W.	South.		North „ E.	
6	N. by E.	E. by S.	N. by E. „ N.	S. by W.		N. by. E. „ E.	
7	N.N.E.	E.S.E.	N.N.E. „ N.	S.S.W.		N.N.E „ E.	
8	N.E. by N.	S.E. by E.	N.E. by N. „ N.	S.W. by S.		N.E. by N. „ E.	
9	N.E.	S.E.	N.E. „ N.	S.W.		N.E. „ E.	
10	N.E. by E.	S.E. by S.	N.E. by E. „ N.	S.W. by W.		N.E. by E. „ E.	
11	E.N.E.	S.S.E.	E.N.E. „ N.	W.S.W.		E.N.E. „ E.	
12	E. by N.	S. by E.	E. by N. „ N.	W. by S.		E. by N. „ E.	
13	East.	South.	East „ N.	West.		East „ S.	
14	E. by S.	S. by W.	E. by S. „ E.	W. by N.		E. by S. „ S.	
15	E.S.E.	S.S.W.	E.S.E. „ E.	W.N.W.		E.S.E. „ S.	
16	S.E. by E.	S.W. by S.	S.E. by E. „ E.	N.W. by W.		S.E. by E. „ S.	
17	S.E.	S.W.	S.E. „ E.	N.W.		S.E. „ S.	
18	S.E. by S.	S.W. by W.	S.E. by S. „ E.	N.W. by N.		S.E. by S. „ S.	
19	S.S.E.	W.S.W.	S.S.E. „ E.	N.N.W.		S.S.E „ S.	
20	S. by E.	W. by S.	S. by E. „ E.	N. by W.		S. by E. „ S.	
21	South.	West.	South „ E.	North.		South „ W.	
22	S. by W.	W. by N.	S. by W. „ S.	N. by E.		S. by W. „ W.	
23	S.S.W.	W.N.W.	S.S.W. „ S.	N.N.E.		S.S.W. „ W.	
24	S.W. by S.	N.W. by W.	S.W. by S. „ S.	N.E. by N.		S.W. by S. „ W.	
25	S.W.	N.W.	S.W. „ S.	N.E.		S.W. „ W.	

In this table the shift of wind is supposed to be observed from a stationary point.

Nos. 6 to 13. The dangerous quadrant when a typhoon is travelling to the westward.

Nos. 14 to 21. The dangerous quadrant when a typhoon is recurving northwards.

Nos. 17 to 25. The dangerous quadrant when a typhoon is travelling north-eastward.

It will be observed that the most dangerous quarter in which a storm can be encountered is the leading quadrant of the right semicircle, for it is that in which a vessel cannot get farther away from the vortex by sailing on, so that she must either heave-to on the starboard tack, or adopt the alternative (in some cases the most judicious course to pursue) of crossing in front of the advancing storm; in such a case it is obvious that no hard and fast rule can be laid down for guidance, but it could scarcely ever be advisable to attempt to cross the storm's path when more than two points from its course, unless it were recurving rapidly.

When a storm is recurving the danger is further increased, together with the embarrassment of the navigator, if his ship be in the dangerous

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quadrant, and especially if she be in that part of it when it would appear equally hazardous either to run or to heave-to.*

When first entering the left semicircle the vessel is always in a position of safety, and may be run or hauled out of the storm on the port tack.

If the wind continues steady in one direction, with increasing violence and rapidly-falling barometer, it is evident that the ship is directly in the path of the storm's centre, which would pass over her; in this case it is necessary to run.

It is essential to heave a ship to on the coming-up tack, so that as the wind veers she may head up to the sea, whereas on the falling-off tack her broadside would be exposed to the seas breaking on board, and also to the danger of being taken aback. To prevent this she should be hove-to on the starboard tack in the right semicircle, and on the port tack in the left semicircle.

Under any circumstances, if a vessel encounter a typhoon, whether overtaken by it or sailing into it, it must be assumed that she is approaching the vortex, and the rate at which she is doing so will be approximately indicated by the fall of the barometer and the increasing strength of the wind.†

In the northern intertropical latitudes the recession of the south-eastern limb of the storm appears to be followed, not unfrequently, by strong squalls or gusts from S.E., which if mistaken for the regular action of the hurricane may occasion erroneous deductions as to the course of the storm.

It also occasionally happens that a typhoon is ushered in by a straight gale, or that one storm is closely followed by a second; it is sufficient to mention this to put the mariner on his guard.‡

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* For instance, with the line of progression W.N.W. it would generally be wrong to scud with the wind N.E., but proper to do so if at N.N.E. This is one of those cases, the vessel being in the dangerous quadrant, in which the experienced seaman, after having given the theory his best attention, and made himself familiar with the law of storms, must follow the dictates of his own mature judgment, for the occasion is one that will assuredly call forth the full exercise of it.

† Lieut. A. Carpenter, R.N., gives the following rule for approximating the distance from the centre by indication of barometer. Place the ship and vortex at 150 miles distance, and allow an approach of 15 miles for every tenth the barometer falls. The gradient differs considerably according to locality, and ranges between 6 and 27 miles for every tenth of fall. Some authorities consider 12 miles to every one-tenth to be a fair approximate.

‡ On October the 8th, 1878, H.M.S. *Nassau*, after scudding for 30 hours before a straight N.E. gale in the Formosa channel, ran into the leading quadrant of the dangerous semicircle of a typhoon travelling to the north-westward, and, the wind continuing the same, encountered the full fury of the storm.—Captain R. H. Napier, R.N.

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Precautions.—If a vessel should happen to be sailing within the typhoon region during the typhoon season, and certain prognostics should appear which seemed to forbode a storm, prudence would require that she should be prepared for encountering a tempest of that nature, even though appearances, at first, might induce one to think that such would not eventually be the result; for whether a mere ordinary gale or a hurricane should follow, it must be admitted that during that season it is the wisest, as it is the safest, plan to be prepared to meet the worst. It must be recollected that Nature herself proclaims the warning, and her admonitions are not to be disregarded with impunity; and the manner of acting in such a case of uncertainty will demand all the resources of mind of the individual commander, especially if placed for the first time in such a dilemma.

Without loss of time the ship would be made snug, hatches battened down, &c., and when brought to the wind it should be under storm sails alone, unless she be on the verge of the typhoon and can sail out of it. It is considered exceedingly dangerous to remain under any kind of square canvas, and even when obliged to scud it is preferable to do so under bare poles; for although on the one hand it may seem advisable to carry top sail on account of the waves rising to so great a height that her way may become deadened in the trough of the sea and the ship pooped in consequence, on the other hand the probability of being taken aback by a shift of wind, when near the vortex, is so great that the danger of foundering would be imminent. The violence of the wind is often so great that boats and spars are literally blown away; the length of the deck is not visible; the clouds descend and blend with the spoondrift; no sail can stand, and ships are frequently dismasted; it becomes therefore the bounden duty of every ship-master to avoid if possible a typhoon at sea, and it is in the highest degree unwise to risk, by hesitation or delay, being caught within the dominion of the storm.

Vessels running up the China sea will generally meet the left semicircle, with the wind between N.E. and N.W., a safe quarter of the storm, and are thus enabled to bear up and run to the southward till it has passed or to sail round its eastern verge with a fair wind.

Vessels proceeding down the China sea are liable to encounter the northern verge of a typhoon, with the wind from S.E. to N.E., which is more or less a position of danger.

A vessel from Hong Kong proceeding through the Bashee channel would in all probability be involved in the N.W. quadrant of a storm advancing westward, with the wind between East and North. This is a

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very dangerous position on the account of the want of sea-room, the number of islands and shoals, and the absence of harbours within reach. A vessel entering the Bashee channel from the eastward would, if overtaken by a storm, be precisely in the same position, but if she first experienced the wind between S.W. and S.E. she would probably be herself overtaking a storm travelling westward, rather than meeting a typhoon recurving through the Bashee channel north-eastward, which is an uncommon occurrence, but known to have happened once early in May and also in August.

In order to make use of a typhoon, the conditions under which it is encountered must be favourable. The vessel must be in one of those quadrants in which her distance from the vortex can be increased at pleasure, and with the wind either blowing fair for the prosecution of her voyage, or likely to veer so as to become fair. If therefore intending to make use of the storm, it would be advisable to keep near its verge by running outwards from the centre with the wind quarterly, before wind and sea become too high, for if they attain any degree of violence it may be difficult to do so, or to regulate the vessel's speed exactly with that of the typhoon if both be travelling together on the same course; for in the latter case it might be necessary to carry some canvas, to prevent being pooped, and this might drive her in advance of the vortex. It must be borne in mind that the progressive movement of typhoons varies, consequently great caution is necessary, for, when travelling slowly, if compelled to continue scudding a vessel would eventually be carried helplessly by the veering wind right across the path of the storm.*

Prognostications.—To be enabled to determine with certainty the approach of a typhoon would be exceedingly valuable, but it has been affirmed that they frequently commence without giving any precursory indications. When it is remembered that 24 hours before its arrival a typhoon is some 200 miles distant, it is obvious that the warning must be a short one under any circumstances, and if unheeded, it is not surprising if the mariner be overtaken unawares.† One can readily imagine that a typhoon travelling with great rapidity from a remote locality, and travers-

* Their progress has been variously estimated. Piddington puts it at from 7 to 24 miles per hour, Lieutenant Carpenter, R.N., at, from 6 to 29 miles.

† Mr. J. W. King, Master, R.N., H.M.S. *Modeste*, observes:—

"We rode out two heavy typhoons during the month of July 1841. The first, which occurred on the 21st, in Macao outer roads, was preceded by calms, sultry weather, increased temperature, and by the barometer falling gradually to 29·40 before the typhoon burst upon us; its lowest was 28·80. The other, which occurred on the 26th, at Hong Kong, gave but little warning of its approach; on this occasion the barometer fell to 28·40."

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ing a region where settled weather was prevailing, might give little or no warning; but if the storm itself be the result of atmospheric irregularity, extending over a considerable area, then it would reasonably be conjectured that signs of its occurrence would not be wanting. Of the prognostications which have been observed, the following indications may be found useful.

A serene sky, with the horizon remarkably clear, should not be considered an indication of a continuance of favourable weather; for a series of fine weather and calms, favouring an increase of heat above the mean temperature, is likely to be succeeded by a typhoon. When the horizon is very clear in some parts, and the summits of the hills or islands obscured by dence black clouds, there is some irregularity in the atmosphere, and stormy weather may be apprehended. Other tokens by which these storms are ushered in are an unusually high barometer accompanying a cloudless sky and sultry weather, with often a sensation of oppression. At other times the sky assumes the threatening aspect which generally precedes a great storm; a greasy halo is observed round sun or moon; the clouds are rolled or tufted in unusual forms and colours (a copper colour being a frequent precursor) with lurid streaks of light; or a heavy bank is seen on the horizon attended with lightning. The storm-wave which is frequently experienced at great distances beyond the limits of the storm is a certain indication, and a confused and troubled agitation of the sea often precedes the storm, and always shows that it is at no great distance. In the northern part of the China sea, a low barometer for several days previous, an ugly threatening appearance, and heavy swell will give sufficient warning, and, provided it be taken, will either enable vessels to get sufficient sea room to avoid the centre of the storm, or give time to secure safe anchorage.

"The best and earliest warning to vessels at sea or in open roadsteads is the heavy swell, approaching generally from a direction not due to the wind then blowing. In low latitudes this swell gives 20 to 30 hours notice before the first wind of the typhoon makes its presence felt, and wherever the roadstead is open to the southward or south-eastward, the swell gives the first indication.

A bright dazzling yellow sunset with greasy clouds generally precedes a typhoon. Cirrus clouds in irregular whisks, followed by a bank of cirrus, or fine cumulus rising to south or east, should induce a careful watch over the barometer. A steady barometer with cloudless sultry weather, and a sense of oppression also often precede them.

In the China seas between latitude 9° and 31° north, assume every disturbance of barometer in summer to be an indication of a typhoon: in nine cases out of ten you will not regret doing so.

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Those who have not experienced the fury of one of these scourges are apt to dis-believe in their frequency, but the long list of casualties amongst shipping in China (even in these days, with a good knowledge of their laws) is sufficient evidence that they are numerous.

When the typhoon has come, it is too late to take steps; and the mariner will then bitterly regret his apathy in not preparing for it."*

Barometric Indications.—The barometer will be found an unerring indicator of the incidence of a typhoon, provided proper attention be paid to its monitions. As a general law, the following will be its movements during a storm:—Just previous to the commencement of the hurricane the mercury will generally rise above its ordinary level; soon after it will begin to fall and the wind suddenly to rise, showing the storm has begun. The mercurial column then descends rapidly, gaining its lowest point as the vortex passes, and commencing to rise rapidly with the first shift of wind to the opposite quarter, again attaining the higher level, and then as suddenly falling to the mean height. These changes will only be thus experienced when a ship crosses the centre of the storm, but it will invariably be found that according to the greater or less velocity with which she closes the vortex or increases her distance from it, in whatever quadrant, the barometer will fall or rise more or less rapidly, and the distance of the storm can be approximately estimated thereby. The barometer will sometimes sink two inches during a typhoon.

The aneroid barometer is of great value at such a time, especially at night, for it can be registered with great facility, and being portable, may be watched constantly, when the marine barometer may not be accessible; moreover its variations occur simultaneously with their causes, showing minute changes that are concealed by the pumping of the quicksilver, in marine barometers, when the motion of the ship is very violent.

TYPHOON HARBOURS.—The following is a list of anchorages on the eastern coast of China where vessels will lie secure in a typhoon or veering gale†:—Tam-tu island; Mirs bay; Swatow; Namoa island (abreast Stewart's house); Tongsang harbour; Amoy harbour; Quemoy island; Makung harbour in the Pescadores islands; Kelung and Tamsui harbours in Formosa; Hungwha sound; Haetan strait, south entrance; Pih-quan harbour; Bullock harbour; anchorage north of

* Remarks by Lieutenant Carpenter, R.N., H.M.S. *Magpie*, 1882.

† Also Canton river above Lintin (p. 103); Hong Kong harbour and anchorages in the vicinity, *see* page 99.

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Takew island; and in the Chusan archipelago, Ting-hai outer and inner harbours, Chinkeamun and Chin Keang harbours, Fisher or Chang-pih island, and Ta-outse on the north-west side of Kintang. Little pass also affords good typhoon shelter for a single vessel.

GALES sometimes blow steadily from E.N.E. or N.E. several days at a time, in September or October, near the south coast of China. In the same months they are liable to occur on the west coast of Luzon, where they mostly commence at north or N.W., and veer to West, S.W., or South, blowing strong, with heavy rain, and a cross turbulent sea, but seldom continuing long.

In the northern part of the China sea, fresh northerly gales of three or four days' duration sometimes occur in December or January, with high barometer and dirty weather.

Strong N.E. gales have been sometimes experienced on the coast of China during the S.W. monsoon; in one of these a vessel, after making the Great Ladrone on July 16th, 1802, was driven by the 20th westward to the Mandarin's Cap, with strong gales, hard squalls, and the current setting from 1 to 2 knots per hour westward. The north-east wind continued nine days, which obliged her to stand out to sea, and she did not arrive at Macao until the 26th.

In May, June, July, and August, severe gales are at times experienced in the north-western part of the China sea, particularly between lat. 14° N. and Haïnan island, with the gulf of Tong King open. These gales generally begin at N.N.W. or N.W., and blow with violence out of the gulf, accompanied by dark weather and a deluge of rain; from N.W. they veer to West and S.W., still blowing strong, and abate as they veer more southerly. When these N.W. gales are blowing in the vicinity of Haïnan and the coast of Cochin China, strong S.W. or southerly gales generally prevail at the same time in the middle of the China sea.

A violent S.W. squall or sharp gale of four hours' duration has been known to occur at Hong Kong in January, causing (besides great damage to the native craft) foreign vessels to drive or lose their anchors. It was preceded by incessant lightning for an hour or two.

From Hong Kong northward as far as the parallel of 30° N. moderate and fresh N.E. gales with rain are liable to occur up to June, but they are not generally so heavy as those which prevail during the monsoon.

Typhoon squalls,* which are distinguished from typhoons by their diameter seldom exceeding a few hundred yards, take the form of a whirling

* Canton has been several times visited by these progressive whirlwinds; which seem to be similar in character to the tornado-like cyclones in America.—R.H.N.

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squall lasting but a few minutes. They are happily rare, occurring occasionally in April and May, and their violence exceeds description. The Barometer gives little or no warning. They are usually preceded by heavy rain clouds, drifting rapidly in various directions, with pendant tongues as for a water spout; air still and oppressive.*

CURRENTS.

The principal currents of the region which this volume embraces are the N.E. and S.W. monsoon drifts and the Japan stream. The two first alternate in the China sea with great regularity, and similarly, though in a lesser degree, on the northern coasts of China; the last-named forms part of the system of the great oceanic currents.†

CURRENTS in NORTH-EAST MONSOON.—The current in the China sea during the N.E. monsoon runs generally southwestward, with a velocity depending on the strength of the wind. When the force of the monsoon is abated, or during moderate and light breezes, there is often little or no current.

In the western parts of the sea, along the coasts of Cochin China and the Malay peninsula, the current generally begins to run to the southward about the middle of October (sometimes sooner on the former coast), and continues until April. During the month of March its direction is constantly to the southward about Pulo Aor, with light easterly winds and calms at times. On the coast of Cochin China, and adjacent to Haïnan island, a current varying from south to S.W. commences sometimes about the middle of September; near the land, from lat. 15° N. to 11° or 11½° N., it increases in strength; but its rate decreases in proportion as it flows southward. During the prevalence of the N.E. monsoon, from about lat. 14° N. to cape Padaran the current near the coast frequently runs 40 or 50, and sometimes 60 miles to the southward in 24 hours; the rate, however, is variable, and it is only in the limits above mentioned that it is occasionally so strong, for its strength abates at cape Padaran, and runs with less velocity to the S.W., towards the entrance of the gulf of Siam.

On the southern coast of China the current during the N.E. monsoon runs almost constantly to the W.S.W., nearly parallel to the land, at a rate of 18 to 48 miles a day, according to the strength of the wind, and sometimes, when a typhoon or a storms happens, its rapidity is greatly increased. At the distance of 60 to 90 miles from the coast it seldom

* Derived from remarks of Lieutenant A. Carpenter, R.N., 1882.

† *See* Admiralty Atlas of Wind and Current Charts for the Pacific, Atlantic, and Indian Oceans.

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runs so strong as near it; and in 30 or 40 fathoms soundings there is much less current than in shoal water near the shore and amongst the islands. The westerly current sometimes slackens, and, contiguous to the land, the tidal streams prevail when not overcome by the force of the current, especially at springs.

Between Formosa and the China coast the current runs to the south-westward at the rate of 1 to 2 knots an hour, according to the strength of the monsoon. On the west coast of Formosa, when light winds prevail, the current is often found setting to the northward. On the west coast of Luzon the current is changeable, sometimes setting southward along the coast, at other times northward. To the eastward of Formosa, about Botel Tobago island, it frequently runs strong to the northward and north-eastward, as early as the 1st of March; and although changeable at times, it sets mostly in that direction during the S.W. monsoon, and in the opposite direction during the N.E. monsoon.

CURRENTS in SOUTH-WEST MONSOON.—In the China sea, at this season, they are changeable, their direction and velocity depending much upon local circumstances. Late in April, or early in May, they generally begin to set to the northward in the south and middle parts of the Sea, and continue to run in a north-easterly direction until September, while the S.W. monsoon is strong; but they are not constant in this monsoon, for at times, when the wind is moderate or light, they are liable to change and set in various directions. After the strength of the monsoon has abated, there is often little or no current running to the north-eastward in the open sea; but sometimes its direction is to the southward.

Along the coast the Cochin China, from Pulo Obi to cape Padaran, the current sets mostly to the E.N.E., parallel to the shore, from April to the middle of October; and during the same period its direction is generally to the northward along the east coast of the Malay peninsula, from the entrance of Singapore strait to the gulf of Siam. To the northward of cape Padaran there is but little current in the S.W. monsoon near the Cochin China coast; for, from thence to the gulf of Tong King, a small drain is sometimes found setting northward, at other times southward. When a gale happens to blow out of the latter gulf from the north-west and westward, the current at the same time sets generally to the south-west or southward in the vicinity of the Paracel islands and reefs, or where these gales are experienced; and this current running obliquely, or contrary to the wind, a turbulent and high sea is thereby produced.

On the southern coast of China the current is much governed by the wind; when strong S.W. winds prevail it runs along shore to the east-

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ward; but seldom strong. Near, and amongst the islands, westward of Macao, there is generally a westerly current, occasioned by the freshes from Canton river, which set in that direction, frequently sweeping along the islands from Macao to St. John between W.S.W. and W.N.W., about 1 or 2 knots per hour. This westerly current is, however, not always constant in the S.W. monsoon, for it slacks at times; then a weak tide may sometimes be experienced running eastward.

On the west coast of Luzon and Palawan the current generally sets northward in the S.W. monsoon, but frequently there is no current, and near these coasts it seldom runs strong. On the north coast of Luzon there is also little or no current. The trade-drift of the Pacific is liable to set to the westward along its shores, and is probably accelerated at times by strong N.E. or easterly winds. Near the Bashee islands it sometimes sets eastward when strong westerly winds prevail; but generally strong to the northward, or between N.N.W. and N.E.

The strength of the current on the eastern coast of China increases with the freshness and duration of the monsoon, varying from one knot to as much as 3 and even 4 knots per hour; and this requires to be especially guarded against when hove-to off a port or running for one in thick weather. Thus many vessels in the S.W. monsoon have run into Hu-i-tau bay instead of Amoy; and again in the N.E. monsoon have picked themselves up off Red bay instead of Chapel island. The current will slack a little at particular times of tide, but during the survey of this coast in 1843 it was seldom found to run to the southward in the southerly monsoon, or to the northward in the N.E. monsoon. At, and eastward of, the Pescadores islands, in the month of August, a current was sometimes experienced of 4 knots per hour, running to the northward, whilst with the ebb it slackened for two or three hours, but seldom ceased entirely. The same has been observed in May.

JAPAN STREAM.—The great oceanic current which has its origin in the N.E. trade-drift of the North Pacific is now known to navigators as the Japan stream, as well as by its Japanese name, Kuro siwo.* The trade-drift, which flows to the westward between the parallels of 9° and 20° N., on reaching the eastern shores of the Philipine islands, recurves to the northward, forming near the northern limit of that group the commencement of the Japan stream. The main body of the current then flows along the east coast of Formosa, and from that island pursues a north-easterly course through the chain of islands lying between Formosa

* *Literally* black tide or stream, so called from its peculiar colour. It is also, but less generally, known as Kuro se gawa, which signifies Black river.

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and Japan, sweeps along the south-eastern coasts of Japan, and continuing in the same general direction is known to reach the parallel of 50 N.

The limits and velocity of the Japan stream are considerably influenced by the monsoons in the China sea, and by the prevailing winds of the corresponding seasons in the Yellow and Japan seas; also by the various drift currents which those periodic winds produce. These variations are exhibited on the Admiralty current chart,* which embodies, in a graphic form, all the most reliable information we possess.

In the N.E. monsoon the Pacific trade-drift attains, at the commencement of the Japan stream, a breadth of 400 or 500 miles, between the northern extremity of Luzon and the meridian of 130° E., and flows in a course between west and N.W. The western portion of this great body of water is pressed westward through the Bashee and Ballintang channels, and joins the monsoon-drift or counter current of the coast of China, which is setting strong to the south-westward at this season into the China sea.

Near its origin the main body of the stream is contracted, and flows to the northward along the east coast of Formosa, being confined between that island and the Meiaco sima group with a width of nearly 200 miles, but northward of the latter it rapidly expands on its southern limit, where its waters are constantly recurving to the east and south-east.

On the south cape of Formosa the current splits, forming a branch which passes westward of that island, up through the Pescadores channel, and round the northern side of the island, north-eastward of which it again joins the Japan stream. This branch has not the same steady flow as the main stream east of Formosa, yet it is sufficient to nullify the opposing southern tidal stream of the coast, whilst it greatly accelerates the northern stream.†

During the S.W. monsoon the Pacific trade-drift off Luzon has a breadth of only 150 miles, but is then augmented by a portion of the monsoon drift current from the China sea, which flows north-eastward through the Bashee and Ballingtang channels at the rate of 40 miles a day; the latter, however, has no permanency of character, for the current in this locality is often found setting to the north-westward. The remaining and larger portion of the monsoon drift from the China sea passes up through Formosa strait, and northward of Formosa is said to blend with the Japan stream, for the limit of the latter has been known to extend as far westward as a line

* *See* Admiralty Atlas :—Wind and Current Charts of the Pacific, Atlantic, and Indian Oceans.

† *See* remarks on these tides on pages 244, 291, and 294.

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joining the island of Tsung-ming (off the China coast north-westward of Formosa) with Tsu sima in the Korea strait. This western limit is very perceptible, both on account of the higher temperature of the Japan stream, and from its waters being of a dark blue or black colour, whilst that of the colder water is of a pale green.

Another branch of the Japan stream flows through Korea strait into the Japan sea, passing the island of Tsu sima.

Along the borders of the stream, where it chafes against the counter-currents and torpid waters of the ocean, and along its margin near the shore where it meets with an opposing tide, races and tide-rips are encountered, often resembling heavy breakers on reefs or shoals, and whirls and eddies are produced by islands and inequalities in its bed.

Velocity, Temperature.—The Japan stream increases in strength as it advances northward, but there are many fluctuations in its rate due to various local influences. The following is an approximation to the daily average rates in the different parts of its course :—

	May to September.	October to April.
Bashee channel - -	18 to 48 miles.	18 to 42 miles.
East Coast of Formosa -	24 to 42 „	24 to 36 „
N.E. of Formosa - -	24 to 48 „	18 „
Coast of Japan - -	48 to 72 „	24 to 48 „

The current attains its maximum velocity south of Sikok and Kii no oösima, Japan, where it has been known to run 100 miles in 24 hours.

Northward of Formosa, in the summer season, the waters of the southern border of the current are constantly diverging to the eastward and south-eastward at a rate varying from 18 to 30 miles a day.

A mean temperature of this current from May to September is 82°, or 7° higher than that of the ocean, due to latitude. The maximum is 86°, which differs 11° or 12° from that of the ocean. Its north-western edge is strongly marked by a sudden thermal change in the water, of from 10° to 20°; but the south-eastern limit is less distinctly defined, there being a gradual thermal approximation of current and ocean as well as of the air.

In the months of April and October hot and cold belts are found alternating in the stream, the temperatures of which vary from 7° to 10°; whilst during the winter months, viz., from November to March, the mean temperature of the stream is 74°, which is about 4° higher than that of the ocean.

Caution.—Although a general knowledge of the currents of these parts has been gained it is still imperfect in minor particulars. It should therefore ever be borne in mind that these oceanic currents have to be regarded in a two-fold aspect, the scientific or theoretical, and the practical.

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It is highly probable that the Japan stream is of some considerable depth, and that it follows an almost undeviating track, which is not always consistent with recorded observations, the fact being that, from whatever cause, the surface water to the depth of several feet is often found flowing in a different direction. But it is these upper currents which chiefly affect a ship's course, and therefore great weight ought to be given to the remarks of experienced navigators, even though they may be difficult to reconcile with theory. The following instances may suffice to illustrate this: In August, off the coast of China, in lat. 27 N., according to theory there should have been a strong northerly current, but it was found by observation that there was an upper current, 18 feet in depth, setting strongly to the southward. It is well known that a branch of the Kuro siwo passes up through Korea strait, but vessels crossing between Shanghai and Nagasaki frequently find no trace of it; and in the vicinity of the islands southward of the gulf of Yedo, although the current may have been setting strongly close up to them from the westward, and is found again directly eastward of them, even washing the coast, yet about the islands the current frequently disappears altogether, tidal streams only being preceptible.

TIDES.

COAST of CHINA.—The tidal wave strikes upon the eastern coast of China, from Hong Kong to the island of Chusan, nearly at the same period; it being high water on full and change days in the neighbourhood of the Lema islands at abont 8h. 30m., and at the outer islands of the Chusan archipelago an hour later. The rise and fall, however, increases considerably to the northward; and in some instances the diurnal inequality is great. The establishment for Hong Kong and several other places along the coast are given in the text of this work, and also in the tide table in the Appendix.

Eastward of Hong Kong, as far as Breaker point, the tides are irregular and weak, and easily overcome by the drift current caused by the monsoon, but after passing Breaker point the coast trends more northerly, and the flood stream is found useful to vessels bound to the northward. The rise and fall increases, passing from 7 feet at Namoa island to 12 feet at Tongsang, and 18½ feet at Amoy. Between Amoy and the river Min the rise of the tide varies from 16 to 18 feet at springs, and this causes the flood to enter on the north as well as on the south side of Hai-tan strait.*

North of the Min the flood sets more determinately to the northward; it seldom, however (unless off headlands or in narrow channels), overcomes

* In Hai-tan straits, spring tides rise from 18 to 23 feet.

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the current caused by the monsoon, although it has the effect of slackening it.

Throughout the Chusan archipelago, and when approaching the estuaries to the northward of it, great care and attention to the tides is necessary, but as particular instructions are given in the body of the work, it only remains here to caution the navigator that, as he approaches the coast to the northward of Chusan, the tidal streams increase greatly in rapidity, and that unless the precaution be taken of acquiring a knowledge of their set and velocity, his vessel is liable to become entangled amongst the groups of this rugged archipelago. The tides attain an exceptional and extreme velocity in Hang-chu bay, page 406.

YELLOW SEA, &C.—The tidal wave stretches upon the outer islands of the Korea at 8h. 30m., which is the same time it strikes upon the outer islands of the east coast of China. Thence it advances up the Yellow sea in the form of a tongue, reaching successively the Shantung peninsula at 4h., Hope sound, Miau-tau group at 10h. 24m., the Sha-lui-tien banks, west part, at 2h. 50m., and the heads of the gulfs of Pechili and Liautung at 4h. and 5h.; but on all parts of the coast which it passes, the time of high water is retarded from 1 to 3 hours, according to the breadth of the sea. The establishment for the entrance of the Yangtse kiang is 11h. 36m., and it is only half an hour later at Sang-tau bay at the south-eastern part of the Shantung peninsula, but in the great intervening bight of the coast to the westward it becomes fully 6h. later. The tidal streams are rotatory in the northern part of the Chusan archipelago, also off the Yangtse, where they are strong, and 150 miles northward of it, where they are weak. Around the Shantung promontory the tides are peculiar, and along its southern coast the flood stream sets to the westward. The rise and fall at springs off the Yangtse is 14 feet, at Kyau-chan bay 12 feet, and at Shantung promontory 6 feet. The tides of the Yangtse estuary are fully described on page 426, those of the Chusan archipelago and Hangchu bay on pages 397 and 406, and those of the Shantung promontory on pages 552 and 553.

On the Korean coast there is a tidal phenomenon similar to that which occurs in the English and Irish channels, viz., a point of maximum rise directly opposite where the rise is at a minimum. The place is Majori-banks harbour in lat. 36½° N., where the rise and fall is 29 feet, whilst at the Shantung promontory it is only 6 feet. The tidal streams on the west coast of Korea are very strong.

About FORMOSA.—The tidal wave from the Pacific strikes upon the Philipines, the east coast of Formosa, the Luchus, and the south coasts of Japan about the same time, viz., 6h., full and change; on the west coast

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of Formosa from 10h. to 11h., on the outer islands of the coast of China about 8h. 30m., and on the coast itself about noon. The flood stream enters the Bashee channel to the south-westward, and the ebb flows out to the north-eastward, and there is little doubt but that they both modify in some degree the set of the Japan stream and S.W. monsoon drift current. This is especially the case during springs, when the tidal streams both south and north of Formosa are very strong, and will probably account for the conflicting observations that have been made on various occasions, but which these opposing influences have rendered difficult of comprehension.

Along the west coast of Formosa the flood sets to the northward and the ebb to the southward, the former being accelerated and the latter retarded by the branch of the Japan stream.

On the northern coast of Formosa the flood sets westward and the ebb eastward, the eastern stream being almost constant from the same cause, but it always slackens on the flood, and occasionally changes, for between Kelung and Craig island the south-western stream has been found running 2 knots. There is no record of the tidal streams of the northern coast of Luzon, but they are stated to be always weak; this part is exposed to the influence of the Pacific drift-current, described on page 21, but even this current is said to be seldom strong near the land.

The tides of the west and north coasts of Formosa are more fully described on pages 244, 291, 294, and 300.

DIRECTIONS FOR MAKING PASSAGES.

SINGAPORE to HONG KONG, in the NORTH-EAST MONSOON.*—There are four routes for vessels making the passage from Singapore to Hong Kong against the N.E. monsoon, viz., the main route, the Palawan passage, the inner route by Cochin China, and the western route. Vessels with full steam power after leaving Singapore strait should steer to pass about 2 to 3 miles north-westward of the Anamba islands, 5 or 10 miles N.W. of Pulo Laut, and 30 miles west of Prince of Wales bank, when a course should be steered for lat. 14° 30′ N., long. 115° 30′ E., thence eastward of Macclesfield bank to Hong Kong.† For small powered steamers the western route by way of Hainan straits is recommended‡ (*see* page 34). Sailing vessels leaving Singapore for China in February, March, and part of April may expect a tedious, beating passage.

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* *See* Admiralty Charts:—China Sea, southern portion, Nos. 2,660A and 2,660B; also northern portion, Nos. 2,661A and 2,661B, scales, $d=3$ inches.

† Mr. E. M. Edmond, R.N.R.

‡ Captain R. H. Napier, R.N. The recent survey of Hainan strait and banks renders this route safe. Pilots can be obtained at the port of Hoihow.

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if they adopt the main route. In March, April, or May they can proceed by the inner passage along the coast of Cochin China, which is generally the most expeditious route in these months.

The passage to China by the coasts of Palawan and Luzon may be followed late in the S.W. monsoon; also without much difficulty in October and November; and it has been made even in December, January, and at every period of the N.E. monsoon.

It was formerly the general custom for the clipper vessels employed in the opium trade between India and China to beat up the middle of the China sea in the strength of the N.E. monsoon, keeping as close to the western edges of the central reefs as possible, where the current was found to be generally in their favour. Many commanders who have been accustomed to make their passages in that way are strongly of opinion that it is the best route for vessels later in the season than the month of November, whilst others who have been accustomed to proceed by the Palawan have just as strong opinions in favour of that route.* The following remarks of Mr. T. B. White, who was for many years in command of clipper vessels engaged in the opium trade, appear to be exceedingly valuable, inasmuch as they furnish a balanced opinion on the respective advantages of the routes. He says: "I am sorry I cannot say much from experience in beating up the Palawan in a sailing vessel, for during the entire period of my command of the *Lanrick* I never once went that way, but always along the western edges of the shoals. I am, however, now quite certain that I should often have made much quicker passages and saved much wear and tear by going up the Palawan. In the *Fiery Cross*, although a powerful steamer, I found it preferable to take the Palawan, and always did so during the strength of the N.E. monsoon (November to February), saving fuel and wear and tear; and, though a longer route, made better passages by getting smooth water and often favourable currents. I believe nearly all heavily-laden ships now take the Pulawan from October until the end of February in preference to the main route, and a current to the north-eastward is generally felt the nearer the Borneo coast is kept aboard and usually the weather is moderate, with a rolling beam-swell on; at least that has been my experience when going up in the steamer. Mr. Reynell, in the clipper *Water-witch*, usually took the Palawan in the N.E. monsoon, and made some very good passages. Now that it is so thoroughly well surveyed, I consider it quite as safe as the main route."

The P. and O. Company's mail steamers, and other vessels of large steam power, steer direct for Hong Kong against the full strength of the monsoon. Vessels of smaller steam power may also at times, when the

* Staff-Commander J. W. Reed, R.N.

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monsoon is not at its height, make the passage in about 10 days by passing west of the Anambas, where a smooth sea may be expected, and then using sail and steam, and taking the best advantage of the wind according to its changes. But if constant foul winds are met, it will be useless to attempt to steam against them.

By Main Route.—The following directions* from Singapore strait to the Natuna group apply with equal force to vessels bound either to the gulf of Siam or Saigon, or taking the main route or Palawan passage, during the N.E. monsoon.

In December, January, and February sailing vessels should not leave the entrance of Singapore strait in strong N.E. winds, but anchor on the northern shore, under the Water islands, in 9 or 10 fathoms. In those months gales often occur at new and full moon; the weather is then thick, the rain lasting two or three days, and the current outside accelerated to the S.S.E. ½ E. from 2½ to 3 knots an hour. A vessel leaving the strait then, instead of fetching St. Barbe island, would fall bodily to leeward and have to work up the west coast of Borneo. Fine weather follows, the wind backing round to North and N.W., and the current in the offing decreasing in strength to about 1½ knots.

Leave the Water islands with the first of the ebb and keep clean full. Stand to the north-eastward to go through the channel between Soubi island and the Great Natuna; a passage that may without much difficulty be made, in these months especially, at full and change, when the wind, after a few hours' calm, frequently hauls to the westward with squalls and rain, and then veers round to the S.W. and south, blowing moderately for about 24 hours.

After fetching Low island, in lat. 3° N., long. 107° 48′ E., if the wind continue easterly, take the starboard tack to the northward, passing westward of Low island, keeping not less than 3 miles from its south-western side, to avoid the shoal water extending 2 miles from its shore. Give Haycock a berth of 3 or 4 miles in passing, as the coral shoal about that island extends fully 3 miles from its south-west side. Large ships should not pass eastward of Haycock at night, as the locality is said to have hidden dangers.

After passing Haycock there will be no difficulty in working up to the south-east point of the Great Natuna from the south-west, as that island obstructs the strong N.E. current of the monsoon. Off its southern shore

* Compiled by Staff-Commander J. W. King, R.N., chiefly from "Sailing Directions between Singapore and the river Saigon," by Mr. A. J. Loftus, commanding the ship *Kensington*, published in the "Nautical Magazine," December 1862.

See Admiralty Charts:—China sea, southern portion, western sheet, No, 2,660A; also Plans of Tambelan islands, No. 361; Anamba islands, No. 1,371; Natuna islands, Nos. 1,348 and 2,104; also China sea Directory, vol. ii.

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at night, in fine weather, the wind is off the land, but it should not be approached nearer then 2 or 3 miles without a good breeze, as the water is deep close inshore, and there is no good anchorage.

From this position the navigator, if intending to pursue his voyage by the main route, must be guided by circumstances, and the directions given in the second volume of the China Sea Directory; but after arriving in the large space of open sea in the parallel of 12° N., northward of the great mass of central reefs, it is advisable, instead of beating to windward, to make to the eastward and work up the coast of Luzon as far as Piedra point or cape Bojeador, so as to ensure fetching Hong Kong on the starboard tack. It should be borne in mind that there is always much danger in passing to windward of the Pratas, Paracels, Scarborough, and other large shoals, on account of the strong lee currents, more especially when the reckoning is doubtful.

By Palawan Passage.—If bound through the Palawan passage,* the foregoing directions must be observed as far as the Natuna group.

Vessels fetching to leeward of Soubi with a northerly wind should take the Koti passage, between Pulo Panjung and Sirhassen island. The Sirhassen passage is also a good channel, and quite safe when the south side of Sirhassen island is kept aboard. The currents among these islands are more regular; but not so in the Api passage, where they set in various directions, and with great velocity to the S.W. from 16 to 19 hours at a time; for large ships any of the other passages are preferable to this, for great caution and perseverance are requisite in working through, as the Borneo coast in from 10 to 11 fathoms water must be kept aboard to avoid the current and profit by the land winds.†

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* *See* Admiralty Charts:—China Sea, southern portion, eastern sheet, No. 2,660 B; also Borneo, West coast, sheets 1 to 9. The directions for the Palawan passage are chiefly by the late Capt. W. T. Bate, R.N.

† Navigating Lieutenant J. W. Reed, R.N., commanding H.M. surveying vessel *Rifleman*, 1866, observes:—"For steam vessels (especially those of small power) proceeding to China by the Palawan passage against the N.E. monsoon, the route by the Api passage and the coast of Borneo presents the followinga dvantages; first light variable winds and smooth water will often be found close to the Borneo coast, when a strong monsoon is blowing 100 miles off it; and next, the Api passage route affords convenient landmarks to lead a vessel safely and expeditiously to the entrance of the Palawan; whereas by the ordinary route much difficulty and delay frequently occurs in making Low island, and in passing between the Royal Charlotte and Louisa shoals.

"Steamers leaving Singapore should pass southward of Victory island, then steer to sight the small island of St. Pierre (carefully observing and allowing for the set of the current), and afterwards for the Api passage, keeping over towards Marundum island rather than Api point. Having passed Marundum and Datu point, the course is clear up to the entrance of the Palawan, passing between the south Luconia shoals and Barram point, and keeping as close to the Borneo coast until abreast of that point as circumstances may make convenient."

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In taking the Koti passage, give Pulo Panjung a good berth to avoid the dangerous reef which surrounds it. The winds amongst these islands and as far eastward as the meridian of cape Sirik are generally from north to N.N.W.

These passages cleared, proceed to the north-eastward, endeavouring, if not certain of the longitude, to make the Royal Charlotte or Louisa shoals, whichever is the weathermost, by running on its parallel of latitude; and as the currents appear to be influenced by the prevailing winds, vessels should be prepared to anticipate as set in the direction in which it is blowing, the velocity of the current being proportionate to the force of the wind.

Having made either the Royal Charlotte or Louisa shoals,* or passing mid-channel between them, steer E. by N. 100 miles, and then about N.E. for lat. 8° N., long. 116° 15′ E., when Balabac peak will probably be seen bearing about East, southerly and making like a rather flat-topped island with a small peak rising in the centre, and when about 40 miles distant from the island, the low hills may be seen on either side of the peak, having at first the appearance of detached islands.

Having brought Balabac peak to bear about E.S.E. at the above distance, a N.N.E. $\frac{3}{4}$ E. course should be steered, when the high land of Boolanhow will soon be discernible, bearing about N.E. by E. $\frac{3}{4}$ E. This course should lead about 6 miles eastward of the reported Roger† breakers, 10 miles westward of the elbow of the bank, and midway between the Royal Captain shoal and the edge of the bank of soundings skirting the island of Palawan (the most dangerous part of the channel). When Boolanhow, the southern mountain of Palawan, bears S.E. by E. $\frac{1}{4}$ E. the vessel will be in line with it and the Royal Captain shoal, and in the narrowest part of the channel, which is 27$\frac{3}{4}$ miles wide, and the high land of Mantaleengahan will then bear E. $\frac{1}{4}$ S.

If the wind be well to the southward, and the weather thick, Balabac island may be approached nearer, in order to get well hold of the land, but extreme caution should be taken not to go within 12 miles of it, as soundings of 26 and 20 fathoms extend that distance off, in a westerly direction from the peak, having shoal patches immediately inside them.

If the wind be to the westward, with thick cloudy weather, Balabac island should not be approached nearer than 36 miles, for these winds usually force a strong current through the straits to the eastward, and when off the south-west end of Palawan it is not unusual for them, particularly in

* *See* Admiralty Charts:—Balabac strait, No. 948; scale, $m = 0{\cdot}5$ of an inch; Palawan Island, No. 967; scale, $m = 0{\cdot}1$ of an inch.

† *See* remarks concerning this doubtful shoal, in vol. ii.

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squalls, to veer to W.N.W., and sometimes N.W., blowing with great violence, and placing the vessel on a lee shore with respect to the shoals inside the edge of the bank. It generally so happens that about the time (September and October) when vessels adopt the Palawan route, this weather prevails off the south-west end of Palawan, rendering it uncertain and difficult to hit the narrowest part of the channel, owing to the land being obscured, especially if neither the Royal Charlotte nor the Louisa shoal has been made, and the longitude corrected.

Under these circumstances it is advisable to advance with caution, regulating the speed of the vessel so as to be in the fairway, viz., lat. 8° N., long. 116° 15′ E., for making the channel at daylight. Horsbourgh recommends lat. 8° 30′ N., and long. 116° 30′ E., but this may be running too close at night, unless confident of the accuracy of the reckoning.

If not certain of the vessel's position, endeavour to get soundings on the edge of the bank to the north-west of Balabac island, and the safest part to approach for this purpose is that about the elbow, on the parallel of 8° 30′ N., or immediately to the southward of it, for it is believed the portion of the bank which is embraced by the bearings of Balabac peak, S.E. by E. ½ E. and S.S.E., comprising a distance of 25 miles, is free from danger. If the peak is obscured, the same bearings of the body of the island will, if taken with care, answer. Or should the north extreme of the island be discernible (showing like a hillock, with a low double hill to the southward), the part of no danger will be included within the lines of bearing of it, East and S.S.E. ¾ E.

During the period that H.M.S. *Royalist* was engaged upon this survey, experience led to the belief that in the thickest weather the land is seldom totally obscured for any length of time, but generally shows a well-defined outline between the squalls.

Having obtained soundings, which will be about 90 fathoms, if close to the edge of the bank, and from 45 to 55 fathoms, sand, if inside, haul off to the north-westward, to give the edge a berth of about 10 miles, then steer the channel course N.N.E. ¾ E. When Boolanhow mountain bears eastward of E. by N. ½ N., the elbow has been passed, and the bank then trends N.E. by N. It is between the elbow and the parallel of 9° 15′ N. (a distance of 60 miles) on the east, and the Half Moon, Royal Captain, and Bombay shoals on the west, that the most dangerous part of the Palawan passage lies.

When Mantaleengahan mountain bears S.E. ½ E. or the Pagoda cliff, which is generally seen when the more elevated land is obscured, S.E. ½ S., the vessel will be on the line of the Bombay shoal, where the channel is 28 miles broad.

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Having passed the Bombay shoal, abreast of which the bank trends N.E. ½ N., steer a course parallel with its edge, preserving a distance of 8 or 12 miles from it, and 27 to 30 miles from the land, or nearer, if convenient, and the peaks on Palawan are sufficiently distinct to get good cross bearings. It is, however, not desirable to get too close, as the edge of the bank in about the parallels of 9° 30′ and 10° N. is not uniform in its outline, and several rocky patches lie within a mile, and in some places only 3 cables from the 100-fathoms line.

This N.E. ½ N. course, edging a little more to the northward when abreast of Ooloogan bay,* where the bank extends 28 miles from the shore, will take a vessel through the passage clear of every known danger.

Vessels working through the Palawan passage, having conformed to the directions given for making the south-west end of Palawan, should, in fine weather, endeavour to make their inshore boards in the afternoon, for the sun being then astern of the vessel, the patches lying near the edge of the bank will generally be distinguished from the mast-head in ample time of tack off. In squally weather also, during heavy rains, these patches have been observed, imparting a very distinct yellowish hue to the surface of the water.

It is almost needless to remind the seamen (when the land is obscured) of the desirableness of getting hold of the edge of the bank before dark, in order that he may have a good departure for the night; and on making his inshore board, it must also be borne in mind that the probability of coming *suddenly* into soundings is great, as the approach on this tack will generally be at right angles to the edge of the bank. He should therefore be prepared to go round immediately on getting the first indication of soundings, whether by the lead or the appearance of the water.

Proceeding northwards from the Palawan passage, it is customary to beat up the west coast of Luzon to cape Boliñao or Piedra point,† and thence direct for Macao or Hong Kong, passing to leeward of the Pratas. But if bound to any of the ports northward, much time may be saved by hugging the coast of Luzon and beating up through the Babuyan and Batan islands, and along the eastern coast of Formosa, thereby avoiding the heavy labour, wear, and loss of time experienced in the attempt to work against the monsoon along the coast of China, which even the clippers sometimes failed in effecting.

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* *See* Admiralty Plan of Ooloogan bay, 2,913; scale, $m = 2{\cdot}5$ inches, a fine harbour of refuge, to the northward of which are Jib-boom bay, port Barton, and Malampaya sound. *See* also Admiralty Plans, Point Emergency to St. Paul bay, No. 2,912; scale, $m = 1$ inch; and Malampaya sound, No. 2,911; scale, $m = 1{\cdot}5$ inches, where also supplies may be obtained.

† *See* vol. ii., p. 258. Piedra point is 7 miles W.S.W. of cape Balinasay, the cape Boliñao of the old charts.

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In working along the Luzon * coast, particularly about dawn and sunset, less sea, and much lighter winds, will be experienced by hugging the coast by short boards, and at times even land breezes may very much facilitate progress; but in the attempt to render these available, great caution should be observed, particularly between Piedra point and cape Bojeador, as several coast-line dangers do not find a place in the charts. H.M.S. *Samarang* met with a dangerous patch in the bay near Dile point, being at the time 2½ miles off shore, with a church bearing E.S.E.

The first strong gush of the monsoon will be experienced on clearing cape Bojeador, but this should not induce the navigator to stand farther westward than will enable him to make his eastern stretch to weather it, when he will at once experience less wind. This generally is the case on all lee shores backed by mountains, either resulting from obstruction, reaction, or the effect probably, after sunset, of counteracting land winds. Among the groups north of Luzon there are no dangers which are not easily avoided, and no continuous strong breezes will be experienced, at all comparable in force, or attended by high sea, similar to those which prevail between Piedra point and Hong Kong. On the contrary, good working breezes and, at times, light winds prevail, enabling a sailing vessel of moderate speed to make about six degrees north in eight days. When standing across for Hong Kong, should a northerly gale be encountered, which is not unusual about the close of the year, it is desirable to keep as far to the eastward as possible, so as to avoid falling to leeward of Hong Kong, for should a vessel be in that position when the gale abated she would be greatly embarassed on the wind veering back to the north-east quarter, which is almost a certainty. It is also strongly recommended not to pass to windward of the Pratas shoal (*see* caution on page 249). Typhoons are likely to happen in both monsoons between the north coast of Luzon and Formosa from July to December inclusive, but sometimes as early as the beginning of May.†

By Inner Route.—Proceed according to the directions given at page 32.

By Western Route.—From Cape Touron, a N. by W. course may be steered (allowing for set) until abeam of the "S.W. point" of Hainan island (to which give a wide berth as the banks are said to extend off it to a distance of fully 22 miles). Mount Etna (4,970 feet) will then be seen if the

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* *See* China Sea, northern portion, eastern sheet, No. 2,661B; also, northern portion of Luzon, with the Bashee and Ballintang channels, No. 2,545; scale, $d = 6{\cdot}2$ inches; and Plan of Manilla bay, No. 976; scale, $m = 0{\cdot}6$ of an inch.

† One passed north-eastward through this channel in May 1866.

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weather is clear. From this position follow the western shore of the island to the entrance of Hainan Strait.*

Lieutenant A. Carpenter, R.N., remarks:—"The banks westward of Hainan strait give plenty of warning by soundings to vessels approaching from north-westward or westward."

"Vessels from the westward should not attempt to make the strait on a dark night as both coasts are low and dangerous. If, however, either coast is well aboard by dusk, a mid-channel course may be taken until the lights of Hoihow town or those of the vessels in the bay are sighted. The bay is frequently empty of vessels."

It may be convenient to anchor for a short time in Touron bay in order to approach the strait at a desirable hour. On clearing the strait, a N.E. by E. course from North bank will lead direct for the Ladrone islands.†‡

SINGAPORE to HONG KONG in the South-west Monsoon.—In the S.W. monsoon the passage from Singapore to China by the Main route, eastward of Pulo Sapatu and over Macclesfield bank, is preferable, both on account of the sea being free from dangers and the winds being more steady in the open sea than near the coast. About full and change of the moon, and as early as April, a westerly breeze will sometimes be found blowing out of the gulf of Siam to carry a vessel to Macclesfield bank, and afterwards easterly winds to run her to Hong Kong.§

This route becomes precarious if a sailing vessel is not up with Pulo Sapatu early in October; for near this island, about the middle of that month, strong southerly currents begin to prevail with light northerly winds, variable airs, and calms, by which many vessels have been delayed for several days, and have made no progress to the northward. Fresh winds from the southward have been met with, even so late as 1st of November, but these instances are rare.

Some vessels proceeding by the Main route have carried strong S.W. and southerly winds,‖ when others taking the Inner passage have at the same time experienced N.W. and westerly gales blowing out of the gulf of Tong King, with dark weather and rain, and have been in danger of being driven among the Paracel reefs; the Inner passage ought, however, to be chosen in the strength of the S.W. monsoon if the vessel is weak

* The banks off Bluff point are said to extend fully 10 miles from the shore.

† Captain R. H. Napier, R.N. *See also* page 26.

‡ *See* Admiralty Chart, Hainan strait, No. 876, and Hydrographic notices, Nos. 30, of 25 August 1881; 13, of 20 April 1882; and 30, of 16 October 1882.

§ *See* Admiralty Charts of China sea, southern portion, western sheet, No. 2,660A; and northern portion, western sheet, No. 2,661A.

‖ Horsburgh.

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and making much water, for the sea will be smooth, and being near the land she may reach an anchorage if required. The gales out of the gulf are not frequent, and the land may be kept in sight nearly all the time.

Inner Route.—Taking the Inner or Cochin China route, steer from Pulo Aor along the coast to the Redang islands, thence across the gulf of Siam, and along the coasts of Cambodia and Cochin China, keeping the latter aboard to cape Touron. From thence steer for the south-west part of Haïnan, coasting along this island and passing between it and the Taya islands; then cross over to make the coast of China about Tien-pak or Hailing island. The islands from thence to Hong Kong may be coasted along at discretion, or shelter may be fonnd amongst them on emergency. If this route be taken before the middle of March or the 1st of April, the passage will be tedious unless the vessel is a good sailer.

Although Horsburg and others recommend the inner route, Commander Blake was of opinion it should be avoided, both on account of the channel being narrower and more dangerous, and from the risk of being carried by the current towards the north-west part of the Paracels, where several vessels have been lost on the shoals, owing to this and to the N.W. winds blowing out of the Tong King gulf. Also, that in this monsoon, it will be found very difficult, in the channel between the Paracels and Hainan, if the weather be cloudy, and with the currents varying in force and direction, to keep the reckoning with sufficient precision to make a safe passage through it.

Bound to Hong Kong in the strength of the S.W. monsoon, with the wind steady between S.E. and S.W., endeavour to make the Great Ladrone* island bearing about north, then steer between it and the Kypong islands, and between Lingting and the Lema islands, for the west Lamma channel. After the middle of August, when easterly winds are likely to prevail several days together, as they are more or less at all seasons, it will be necessary to make the N.E. head of the Lema islands, and proceed in by the Lema channel, towards the west Lamma channel. The east Lamma channel is also safe in both monsoons, for if the wind falls light it is safe to anchor in, although the water is deep and there is little or no tide.

HONG KONG to SINGAPORE in the North-east Monsoon.†—Ships bound from China to Singapore, or to the Straits of Gaspar or Banka, should in March and April adopt the Main route by the Macclesfield bank, which is the most expeditious in these months,

* *See* Admiralty Chart, China, East coast, sheet 1, No. 2,212; also Directions in chap. ii., pages 72 and 86.

† Principally from Horsburgh.

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keeping to the eastward on leaving the China coast; and also in passing Pulo Sapatu they ought to borrow to the eastward towards the shoals, where the winds are more favourable in these months than farther to the westward. In April the *Vansittart*, by keeping about 3 degrees more to the eastward than the *Herefordshire*, made as much progress in one day as the latter did in ten. The distance from Hong Kong to Singapore by the main route is about 1,480 miles, and by the inner route 1,440 miles.

At all other times the Inner route by the coast of Cochin China seems preferable; for it is the shorter, and the ease afforded to ships by steering from the Grand Ladrone immediately before the wind, when blowing strong at N.E., is a great advantage; whereas by the Main route a S.S.E. course is shaped for the Macclesfield bank, often bringing the wind and sea before the beam, which strains a deeply-laden ship. Many have strained so much, that, in order to gain upon the pumps, they were forced to bear away for the Inner route; others, by persevering in the Main route, have laboured excessively, and some of them at last foundered with their crews. Some of the ships which, after leaving China, have been missing, have probably suffered from the same cause. Had those ships, on leaving Canton river, steered S.S.W. ½ W. or S.S.W. ¼ W., the direct course for the Inner route, they probably would not have strained in the least, but have reached their ports of destination in safety. Besides a southerly current of 30 to 50 miles a day is found near Hainan, and between the parallels of 14° and 11° N. of 60 miles a day. After passing the Paracels, the Cochin China coast may be approached about the latitude of cape Varela or the Pagoda, and thence a course steered for Pulo Sapatu or the Catwicks.

Vessels may, according to circumstances, pass either to the eastward or westward of the Catwick islands and Pulo Ceicer de Mer, or through any of the channels between them; but since the Rawson shoal (vol. ii., page 80) is known to have no existence, it would seem advisable, in thick weather, to pass 20 or 30 miles eastward of Pulo Sapatu, especially at night. From thence, passing westward of the Charlotte bank and the Anamba islands, steer to make Pulo Aor.

Should the weather be thick, and a fresh breeze blowing, when near Pulo Aor, round to under its lee, and wait a convenient time to bear up for the strait.* The current between this island and the east point of Bintang sets about S.S.E., by which it often happens that vessels leaving Pulo Aor steer too much southerly, and are swept with the current and the ebb tide coming out of the strait, so far to leeward of Bintang, that they have been obliged to proceed round it, and come up through Rhio strait.

* Since the establishment of Horsburgh light, on Pedra Branca, there is really now no difficulty in making Singapore strait at any time with proper attention.

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In March, during the latter part of this monsoon, the winds are steady from the eastward, the weather settled, and the current weak. In April the prevailing winds are also from the eastward, but are much lighter and accompanied with calms and squally weather; from the latter end of this month to about the middle of May the monsoon gradually breaks up.

HONG KONG to SINGAPORE in the South-west Monsoon.—Captain Blake, of H.M.S. *Larne*, adding to his own experience that of several commanders of the opium clippers, makes the following remarks:—

"Although formerly considered impracticable, it is now a common practice for ships to work down the China sea at all periods of the S.W. monsoon. After leaving Hong Kong the usual course is to stand towards Haïnan, which will be often fetched without tacking, as the wind frequently blows for days together from the south-east or eastward in that part of the China sea; and thence across the gulf of Tong King to the Cochin China coast. Land and sea breezes and smooth water generally prevail close to that coast, for which reason it is usual to work down as close to the shore as possible, taking advantage of every slant of wind, but being careful not to get too far off the land. It is sometimes possible to get as far to the southward as cape Padaran in this way, but generally after passing cape Varela the monsoon is found blowing very fresh, with frequent hard squalls out of the gulf of Siam, rendering it impossible for a ship to do much to windward. From cape Varela, or from cape Padaran, if a vessel has been able to fetch it, stretch away to the southward—making a tack, if necessary, to weather the West London or other reefs—till the coast of Borneo is reached, along which work, and pass out through any of the South Natuna channels. Stand across to Singapore, keeping well to the southward before closing Bintang, to be sure of your landfall, as the currents run very strong, sometimes 2 miles an hour to the northward.

Captain Becher, R.N., writes:—"A ship leaving Macao bound to the southward against the monsoon, should work down for the Macclesfield bank, keeping between the meridians of 116½ and 119½ E., and profiting by every change of wind in her tacks. Having passed the Paracels, she would continue to the southward, not making long boards to the westward on account of the strong northerly currents off the coast of Cochin China, which sometimes set 50 miles in 24 hours. This coast should not be sighted. After passing Pulo Sapatu she would make short tacks, avoiding the entrance of the gulf of Siam, where light variable winds from the southward will be found. Sometimes, however, W.N.W. winds are to be had, and even N.W., but they are never of long duration. The Natunas

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may also be sighted to the southward, and then the channel taken between them and the Anambas.

"It is better in general to take this channel than to sight the Malacca coast and the island of Tioman, off which light southerly winds and calms are found, which oblige vessels to anchor, to prevent their being drifted to the northward by the current.

"The passage may thus be made in about 33 days. At some periods, however, it is a passage not without great difficulties. In June, July, and August, for instance, a vessel of ordinary sailing qualities should not attempt it, unless she can start with favourable winds on leaving the China coast, or unless compelled to do so from necessity. A vessel leaving China early may make a tolerable passage to Bengal by this route. But if bound to Bombay a vessel will have a long passage there in October and part of November. A vessel leaving China in May or June would probably reach Bombay as soon or even sooner by the eastern straits than by beating down the China sea to take those of Malacca or Sunda."*

HONG KONG to MANILA and back.—Vessels trading between Hong Kong or Macao and Manila continue to do so during both monsoons.† If bound to Manila in the N.E. monsoon, they pass through the Lema channel, and keep as far eastward as possible, making for the north-west coast of Luzon, towards Piedra point (cape Bolinao). At this season the current sets strongly to leeward, but is found to decrease as the vessel nears Luzon. Having reached the latitude of this cape, or the coast near it, the vessel should not be kept too close to the shore on account of the outlying shoals, and having passed the Sisters, the course should lie about 6 to 12 miles from the land, till she is to the southward of the islands and dangers off cape Capones, whence she may continue along the coast for Manila bay.

If bound to Manila in the S.W. monsoon, take every possible advantage of the wind veering to S.E. or East to make southing. From the Macclesfield bank a vessel is sure of reaching Manila; indeed, if it were not for the wind veering from S.W. to South and S.S.E. Manila might be fetched on one tack. If passing to windward of the Scarborough shoal, caution is necessary on account of the lee current. Making the land with the wind at South, Luban or Goat island should be sighted, and the land southward of Manila bay.

If returning from Manila in the N.E. monsoon, keep the land as far as Piedra point, and if the wind permit, stand across for the Lema channel

* "Navigation of the Indian Ocean, China and Australian Seas," by A. B. Becher, Captain, R.N.

† *Ibid.*

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south of Hong Kong. But with N.E. or northerly winds, especially if the vessel is not a good sailer, the coast should be kept as far north as cape Bojeador, before standing across for China.*

In March 1883, an extraordinary current was experienced by H.M.S. *Encounter* (Captain George Robinson, R.N.), when on passage from Manila to Hong Kong; setting the ship 51 miles towards the Pratas shoals in 24 hours. From the record, it appears that on the 4th of March the *Encounter* was in latitude 19° 1′ N. and longitude 118° 32′ E. at noon, with no previous current, weather fine, sea smooth, light N.E. breeze. The observations taken at noon on the 5th placed the ship in latitude 20° 22′ N., and longitude 116° 41′ E., showing a set of 51 miles N. 70° W. in the 24 hours; on the following day (6th March) the current is noted in the *Encounter's* log book, as N. 54° W. 34 miles, wind N.E. from 2 to 5, and weather fine from the 4th to the 7th of the month.

If returning from Manila in the S.W. monsoon, the course is direct for the Lema channel or Great Ladrone, making due allowance for the lee current. According as the wind, on approaching the coast, is S.W. or inclines east, so, one of the more weatherly channels between these islands should be entered.

HONG KONG to MACAO.—It is usual to proceed by the Cap-sing-mun pass, this route affording a smooth water passage, but it is not the shortest, and the tide is sometimes found too strong in the pass for vessels of small steam power to stem. To take the shortest route, pass inside Green island, and steer for the north point of Chung island, and pass between it and Lantao. In the middle of this channel there is a large rock, level with high water, and visible as it is approached. The vessel should pass between this rock and Chung, the least water being 6 fathoms. Afterwards take the channel between High Green and Lantao, keeping in the middle of it in 7 fathoms. Beyond this the chart is sufficient guide.

PASSAGE EAST of FORMOSA.†—When bound from Hong Kong to Fu-chau fu, Ning-po, Shanghai, or the ports of Japan, during the N.E. monsoon, a vessel should be in good condition for contending with rough weather and for carrying sail. The best plan appears to be to work along the coast as far as Breaker point,‡ and then stretch across to the

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* *See* Caution on passing the Pratas shoal, on page 249, also remarks on making Hong Kong on page 33.

† *See* Admiralty Chart :—China, from Hong Kong to gulf of Liautung, No. 1,262 ; scale, $d = 1 \cdot 8$ inches. Also, Formosa island and strait, No. 1,968 ; scale, $d = 6 \cdot 3$ inches.

‡ Towards the close of the N.E. monsoon, and still later, it would seem preferable to cross over towards Luzon rather than beat up to Breaker point against fresh N.E. breezes, as the following remarks of Captain David W. Stephens, of the British ship *Harkaway*, tend to show:—" Ships from Hong Kong, bound through the Bashee or any

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south end of Formosa, and work up eastward of that island. By remaining in with the coast of China she will have the advantage of the land wind at night, of smoother water, and the ebb tide out of the deep bays, which will generally be under her lee on the starboard tack, and in the event of its blowing too hard to make way, there are numerous convenient anchorages. It will be prudent to keep within ten miles of the coast, to avoid being swept to the southward by the monsoon drift whilst standing off the land; but as this cannot be done at night without risk, a vessel should, if possible, anchor in the evening, and weigh in the middle watch, when the wind, generally coming more off the land, will enable her to make a good board on the off-shore tack. By passing eastward of Formosa, the heavy short sea of Formosa strait will be avoided, as well as the constant set to the southward during this monsoon.

After rounding the south end of Formosa, off which there is generally a troublesome sea, a vessel should make short tacks, if requisite, to keep within the influence of the Kuro siwo or Japan stream (page 21), which has sometimes been found running northward at the rate of 30 or 40 miles per day.

This coast is not visited by the full strength of the N.E. monsoon, which probably results from the mountainous character of the country preventing the breeze blowing home. Sailing vessels, however, experiencing strong gales at 20 miles to the eastward, might feel cautious in venturing inshore. Nor is there any necessity to run to leeward; but if they should experience the breeze declining in strength, with less sea on the western board, particularly between 9h. a.m. and 3h. p.m., or up to sunset, they will find it advantageous to hug the coast as far as may be deemed prudent; but caution is requisite, for the coast is mountainous and steep-to, and sudden loss of wind accompanied by inconvenient swell might be attended, if followed by calm, with imminent danger. Stronger breezes with much rain are met as a vessel advances eastward during the N.E. monsoon.

Others maintain that an off-shore course whilst passing Formosa is the better, but also admit that it causes much injury to sails and rigging, on

of the other channels between Formosa and Luzon, from March to June inclusive, but more particularly in March and April, during brisk north-east winds and a strong westerly current, frequently take a week beating along shore to reach Breaker point before standing off; whereas, if after clearing the Lema channel the vessels had stood off on a wind, clean full to the south-east, they would soon have got out of the westerly current, and on nearing Luzon would experience the wind more from the eastward and sometimes from south-east, enabling them to tack to the N.N.E. with a strong current in their favour, and thus would probably get to the eastward of Formosa in less time than it would have taken to reach Breaker point by keeping along the coast of China."

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account of the constant succession of bad weather, there being generally a double-reefed topsail breeze, and a heavy sea to encounter.

There are no harbours on the east coast of Formosa, except Sau-o bay, towards the north end of the island, and deep water will be found close to the land. The mountains rise almost immediately from the sea, their sides in some places being cultivated. H.M. brig *Plover* anchored on an uneven bottom in Black Rock bay, the vessel swinging from 13 to 22 fathoms, and rode out a gale from the S.W.; but it is by no means to be recommended.

Having weathered the north end of Formosa, it will still be advisable to keep to the eastward, and not approach the continent until the parallel of lat. 30½° N. is gained. Should, however, a vessel be driven to the westward, she may always calculate on smooth water, and be able to tide it through the southern part of the Chusan archipelago; and if disabled and in want of spars she can remain at the southern side of Duffield pass, and supply herself from the Fu-chow wood junks.

HONG KONG to SHANGHAI in the N.E. Monsoon.—If bound from Hong Kong to Amoy, or the ports between that place and the river Min, a vessel will generally find a difficulty in getting round Breaker point;* for the tide here is of no use, and all there is to assist is the likelihood that the wind will draw off the land after midnight, when, by being inshore, a good board can be made, and possibly Good Hope cape reached. Hai-mum bay cannot be recommended, but still it would be better to anchor there than to be carried round the point. In this case, should West hill be obscured, if drawing less than 13 feet, run in under the point, lower a boat, and let her find the sunken rock (page 167), and then come in with good way to windward of Parkyns rock, and shoot up round the boat into Fort bay.

Having reached Good Hope cape, the flood will assist a vessel to round it, and the ebb out of the Han river will be a weather tide. In the latter case, and not intending to go inside Namoa island, endeavour to get along the south side of the island, where there is an eddy tide, and anchor in South bay, should the weather prove too bad to proceed on the flood. Both tides will be found strong off Three Chimney point, and the same may be said of Jokako point, round which vessels should take the first of the flood on the port tack.

* *See* also commencement of last article and note thereon. It must be borne in mind that when north of Formosa a good passage can only be made by keeping near the coast.

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Farther northward, about Rees island, the flood tide in strong winds causes an uneasy sea, which will distress a vessel much. Red and Ting-tae bays will be found good stopping places; and the latter should be preferred though at the loss of 2 or 3 miles, to anchoring in an exposed position in the entrance to Amoy harbour; as when the N.E. winds freshen off here on the flood, they generally bring a mist in with them, which makes it difficult to find the entrance, and at the same time a vessel will have trouble to get out of the harbour against the tide.

To the northward of Amoy are Leeo-lu and Hu-i-tau bays, both of which afford good shelter. Chimmo bay is not so good, but with plenty of good ground tackle vessels may ride in it. The current in the monsoon overcomes the tide here; and advantage must be taken of every slant of wind, bearing in mind that it is likely to draw off the land in the middle watch, and in the event of anchoring for shelter this is the time to start, should the wind moderate; by waiting for daylight vessels lose their offing, and will have to make an off-shore board at a loss. The fogs are at times thick, but the lead is not a bad guide, as the soundings generally change from sand to mud as the shore is approached. There is also fair anchorage under Pyramid point, but not so good as that under the South Yit; and if the vessel is looking up north or anything east of it, the ebb out of Meichen sound will be of assistance.

From the Lam-yit islands, or the south end of Hai-tan strait to the White Dog islands, is beyond doubt the most difficult part of the passage. For steamers Hai-tan strait affords the best route; but sailing vessels should decidedly keep outside, and stretch over to the north-west coast of Formosa (page 291), where they are likely to get a slant of wind, and the advantage of a weather tide; and as this portion of the coast has been surveyed, with attention to the soundings no vessel can come to any harm.*

River Min to Chusan Archipelago.—North of the river Min the ebb is generally a weather tide (unless the wind is far to the north), and vessels will get a good lift out of the river, and of Ting-hai and Sam-sah bays. With the flood, the indraught into the latter will be

* Lieutenant F. C. Jackson, of H.M.S. *Sheldrake*, remarks with great truth that, "It "very often happens a hard blow on the coast during the N.E. monsoon will be followed "by 3 or 4 days fine weather and light winds. Small vessels proceeding to the north-"ward should take every advantage of these lulls to push on, and even run during the "night if the coast is clear, and circumstances will admit."—Navigating Officer's Remark Book, H.M.S. *Sheldrake*, 1878.

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sensibly felt as far out as Larne islet, and increases to 2 and 3 knots as the main is closed. As a general rule, tack for the inshore tide, when the moon is on the meridian.

Tung-ying island is a snug anchorage, and here the coast must be forsaken (unless under 12 feet draught), and the deep water to the eastward kept in. The tide will afford but little assistance until the Chusan archipelago is reached; the flood causes an uneasy sea in the shallow water, while the ebb has too much southing in it, unless the wind is eastward of E.N.E. Nam-ki and Pih-ki-shan islands afford good shelter.

On reaching the Archipelago, take Beak Head channel unless the tide is nearly done, in which case Harbour Rouse and the south side of Luhwang island afford anchorages under the lee; and as the first of the ebb runs northward through the Foto channels, the tide through may be saved, and anchorage gained on the Ketau shore. From hence, if bound to Ting-hai harbour, contrive to arrive at the west end of Tower Hill island about slack water; otherwise in light winds the vessel is liable to be carried on to Just-in-the-Way, and even through the Black-wall channel.

In working through the north part of the Archipelago, as the set of the ebb and flood trends nearly east and west, advantage can be taken of the tide, and vessels may count on feeling the influence of the ebb within an hour of the moon's meridian passage. When near Gutzlaff the first of the flood takes a direction southward of West, running into Hang-chu bay.

The eddy tide, generally speaking, will carry vessels clear of the large islands; but when they are approaching detached rocks great attention is required to prevent being set in amongst them.

HONG KONG TO SHANGHAI in the N.E. Monsoon. Directions for small powered steamers.

Captain R. H. Napier, R.N., gives the following directions for small powered steamers *of light draught* using the inshore passage from Hong Kong to the Yangtze-Kiang during the adverse monsoon.

Leaving Victoria harbour (Hong Kong), the Fotaumoon pass may be taken, if desired, by steamers of 13 feet draught or under; otherwise, after rounding Tam-too island and passing on either side of Basalt island (but eastward of Hole island), steer for Mirs point; and skirting the coast closely to Teyih point, and going inside of Middle rocks,* pass Fokai point at ½ a mile, and Tung-ting at a mile. Follow the bend of Hong-hai bay to Goat island; and from thence to Chelang point (leaving Reef islands on the starboard hand), Tung-ki island, and Turtle rock. From here (avoiding Balfour rock) the trend of the coast should be again followed

* This must not be confused with Middle rock.

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at about 4 miles distance to Breaker point. Tong-lae point should not be approached too closely. Between this and Hai-mum point the water will probably be found deeper than shown on the chart.

The full sweep of Hai-mum and Hope bays should be taken advantage of and Tide point passed close. From Good Hope cape a course should now be made for Brig island (passing outside the Dove rock buoy), through Namoa Straits, north of Dioyu rock to Owick point; from thence, inside Bell, Cliff, and Square islands, close by Cone point, following the curve of the coast to Thunder head. After leaving Thunder head and passing inside Rees rock, through Rees pass and north of Gor and Ching rocks, round Hut island* (Tagau point) at 3 cables, and passing inside Cliff island, follow the trend of the coast, past Black rocks, Cork point, and House hill point, to Notch island, and from thence on, hugging the shore to Chin-cha point. After crossing the entrance to Amoy harbour, steer from Quemoy spit to Leeo-lu head, and either through Dodd pass† or outside the Dodd ledge for Scrag point.

From Scrag point the trend of the coast and bays should be followed at a ½ to 1 mile distance, to Rogue's point. From here stand well in to Ping-hai bay; past Ping rock, and so, through Lam-yit channel *north* of the Passage islands and, rounding Vangan point, through the Haitan straits close to the Tessara islands; from which shape a straight course for Spider island, the Leon channel, and through either Little or Chuh-pi passes (the former best) into Lishan bay.

From Lishan bay, a direct course may be taken to Ping-fong island, rounding it to the eastward, or the Pih pass used, but the latter, though safe, is *extremely* narrow and not specially recommended.

After leaving Ping-fong, the coast should not be approached too closely, but a direct course steered for Tung-pwan island (taking care to avoid Farmer rock, which is only visible at low water). Running now past Bullock harbour and inside Flask island (or if preferred by vessels of 14 feet and under, through San-pwan pass),‡ between Flask and Seo-luk islands, outside the Flat rocks, *west* of San-shi and She-tung, and leaving Chik-hok one mile on the port beam; steer direct for Chuh-seu island and Barren bay, taking care to borrow on the Kin-men island shore.

After leaving Barren bay, and passing Tripple island, (taking care to avoid the Heroine rock), Cape Conway, and Montague island at about 2 miles distance, a northerly course will lead to Buffalo Nose channel. From thence the track leads through Gough pass, round Ketau point, through Tower Hill and Blackwall channels; and so, on to Gutzlaff island. (Keeping

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* *See* Admiralty plan, No. 811.

† *See* Admiralty plan, Hu-i-tau and Chimmo bays, No. 1959.

‡ *See* Admiralty chart, No. 1763.

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west of Dunsterville, Volcano, and Rugged islands.) After passing Gutzlaff island follow the directions (Chap. VIII., pages 420 and 433) to Shanghai.

"Care is necessary when navigating this part of the coast, as the tides run strong."

"It should be borne in mind, that at all times during the N.E. monsoon, the weather is uncertain, and strong breezes set in without any warning, sometimes lasting for two or three days, or even more. Fogs are experienced in the early part of the year in the same manner."

"No vessels of small steam power should attempt to proceed northward during the N.E. monsoon, except by the inshore passage; and the same might be said of the Typhoon season."*

It is presumed that vessels availing themselves of the foregoing directions will anchor at night.

Good shelter during the N.E. monsoon may be obtained at convenient distances along the coast. (See List of Anchorages, Appendix 688, page 689.)

HONG KONG to SHANGHAI in the S.W. Monsoon.—When the S.W. monsoon is established on the coast of China, there is no difficulty in making this passage, but north of the Min it is often as late as May or June before it sets in, and north-east winds may be said to prevail nine months out of the twelve; therefore, as late as June and as early as August, the passage is likely to be found tedious, as the following examples will show. In May 1859, during a nine days' passage, H.M.S. *Dove* had the wind N.E. five days (fresh and strong breezes with rain); East and S.E. two days; and only 30 hours from S.W., veering to the west, with very fair weather. In the early part of June Commander J. Goodenough, R.N.,† on passage from Hong Kong to Chusan, experienced a N.E. gale which lasted five days. In August 1858, H.M.S. *Actæon*, occasionally towed by the *Dove* gunboat, took 14 days to make the passage, having north-easterly winds for six days and south-westerly winds only five days. The S.W. breezes did not reach the parallel of 27° N., but the N.E. winds blew fresh as far south as 23° N. Inshore, the winds were generally light and the sea smooth, but on standing far out from the coast strong N.E. winds with considerable sea were frequently met, the high swell appearing to indicate a prevalence of those winds. In the offing also, contrary to general experience, the current was found usually setting to the S.W., and on one occasion during a calm, 20 miles outside the Tae islands, its rate was 2 to 3 knots. This current was found by observation to be a surface current

* From the remarks of Mr. T. E. Cocker, commanding the Chinese Revenue Cruiser *Ling-fung*.

† H.M.S. *Renard*, 1860.

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16 feet in depth. It is said that at this season the clippers and mail steamers always make the passage along the land; the former can then find anchorage and take advantage of the tides.

In making this passage, therefore, it will be well to remember that between the parallels of 25° and 30° N., north-easterly winds prevail throughout the year, but alternate with calms, variables, and S.W. winds during the summer months.

SHANGHAI to HONG KONG in the N.E. Monsoon.—After passing the Saddles and Video it is recommended to steer a good off-shore course, passing outside the outer islands, giving them a good berth by night, and hauling in in the daytime to sight them if no astronomical observations can be obtained, for a continuance of thick, hazy, or rainy weather may always be expected, which renders it expedient to identify the land as often as possible. The passage is reckoned to take from 3 to 5 days.*

SHANGHAI to HONG KONG in the S.W. Monsoon.—There will not be the same difficulty in getting to the southward against the southerly monsoon as there is in going to the northward against the other, as it is not so permanent in its direction, and land and sea breezes prevail: the current has generally been found running strong to the northward in Formosa strait, but vessels are not liable to the same detention which they often experience in the northerly monsoon. Care, however, must be taken not to overshoot the port when fogs prevail, as they do in the early part of the season, rendering the navigation at times as harassing as in the N.E. monsoon; they, however, generally lift in the vicinity of the land, and a ship's length from where the bowsprit can hardly be seen will carry her into sunshine.

Captain Sir Frederick Nicolson, R.N., C.B., H.M.S. *Pique*, 1858, observes:—"The chief difficulty to overcome in making the passage between the gulf of Pe-chili and Hong Kong during the southerly monsoon is the strong easterly or north-easterly current. After passing the parallel of the Yang-tse-kiang it will be advisable to keep near the China coast; for although a vessel my lie up South or S. by E. on the starboard tack, it should be remembered that she is making little better than a S.E. course in consequence of the easterly set. A stretch to the north-westward, though apparently a loss of ground, will ultimately prove useful.

H.M.S. *Pique*, in making this passage in July and August, was not favoured when close inshore by any land and sea breezes, nor had the least

* As a good light has now been established on Steep island, these directions may be somewhat modified, and the Steep island pass taken at night.

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slant, but generally lost the wind. A weather tide was occasionally felt when near the shore in the Formosa channel.* *See* also directions, p. 150.

Although the constant adverse current makes this a tedious passage against the monsoon, there is nothing to prevent a vessel of moderate sailing qualities making the passage at this season. The *Pique* had seldom more than single-reefed topsails, and the sea was generally smooth; she made the passage from the gulf of Pe-chili to Kong Kong in 31 days.

PASSAGES across FORMOSA STRAIT.—If bound across Formosa strait from Amoy or Fuchau to the ports of Formosa, Takau, Tamsui, and Kelung, or making the return voyage, sailing vessels will find considerable difficulty in making the passage at all times of the year; and the greatest care will be requisite even in steam vessels, for the course is directly across strong, variable, and sometimes opposite currents. The greatest difficulty will be experienced at the change of the monsoon, when it is no uncommon thing for a vessel to be set 30 or 40 miles northward or southward† during the night, and sometimes, though a less distance, to windward, against a strong breeze; and should calms or alternating winds occur, as is frequent at the same season in the neighbourhood of the Pescadores, a vessel will be in some danger of being drifted amongst them. When, however, the monsoon has fairly set in, an allowance of two knots an hour to leeward may be made, which will enable the navigator to keep a pretty accurate reckoning. But this rule would rather apply to the southern and western parts of the strait; for on the west coast of Formosa the tidal streams are generally regular, at least at springs, and north-eastward of the Pescardores the influence of the Japan stream is almost constant (*see* pages 21 and 291). It must also be borne in mind that north of Formosa strait N.E. winds prevail during the greater part of the year, and the accompanying drift current is liable to be met with even during the summer months.

In the N.E. Monsoon.—If bound‡ from Amoy to Takau a course should be steered for the Rover channel, making an allowance of two knots an hour for current and leeway. In the Rover channel comparatively smooth water will be found. If the same current be experienced on the eastern side of the Pescadores, a good luff must be kept until Fort

* Now called Pescadores channel. In the old charts and sailing directions, the channel next Formosa was called the Formosa channel, and that between China and the Pescadores, Pescadores channel, now changed to Formosa strait.

† The directions for making these passages are chiefly from the Remark Book of Navigating Sub-Lieut. R. W. Middleton, R.N., H.M.S. *Cockchafer*, 1869.

‡ *Ibid.*

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Zealandia be made, or Ape hill, which is visible upwards of 30 miles in clear weather; when the coast may be run down in smooth water. In thick weather the lead will give good warning.

If bound from Takau to Amoy, work up the Formosa coast so as to be able to stand through the Rover channel, hugging the shore on its north side, from which a moderately good sailing vessel will be able to fetch Amoy easily.

In the S.W. Monsoon.—If bound from Amoy to Takau, it is strongly recommended to make all the southing on the China coast by beating down 30 miles as far as Knob rock, or farther if the wind be light, which may easily be accomplished by a vessel of not very heavy draught tiding it close inshore. Then, standing off with a good luff will insure fetching Takau, and as the sea in the strait will be tolerably smooth, no damage need be apprehended from the heavy swell on the Formosa banks.

Vessels which on clearing the harbour have headed up S. by E. and S.S.E., and stood across at once, have only succeeded in fetching the Rover channel, after passing which it has taken from 10 to 14 days to beat down to Takau against the strong current which sweeps up the Formosa coast, at a short distance from the shore. Under such circumstances it will be better to keep as close in as possible, so as to take advantage of the tides.

If bound from Takau to Amoy, and the wind be light, a course about W. by N. should be steered until clear of the Pescadores, as calms are very prevalent about that group, and a ship is liable to be drifted amongst the islands and endangered, or otherwise compelled to anchor in deep water, for eastward of the group the northern stream, accelerated by the Japan stream, runs sometimes at the rate of 4 knots an hour.

YANGTSE KIANG to NAGASAKI.*—Steam vessels, or sailing vessels having a fair wind, should steer, from the entrance of the Yangtse, a course to pass between the Meac sima (or Ass's Ears) and Pallas rock. The direct course from the Amherst rocks to Nagasaki is E. by N. easterly 390 miles, which leads midway between Pallas rocks and the Goto islands, but it is not considered a prudent course to steer, on account of the vessel having to pass across the branch of the Japan stream which sets through Korea strait, from which cause vessels have been carried over to, and even to the northward of, the south end of the Goto islands. During the season of the S.W. monsoon this current has generally

* From the Amherst rocks to Nagasaki a constant set to the northward of about 14 miles a day was experienced by H.M.S. *Lily* when making the passage in April 1881.—Navigating Officer's Remark Book, H.M.S. *Lily*, 1881.

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been observed between the meridians of 125° and 127° E., and has sometimes extended to 129° E., but its velocity has never been recorded as exceeding one knot per hour, and sometimes, especially in the winter season, it has not been observed at all.*

There is no difficulty in making this passage, except when baffling winds and thick, rainy, and squally weather are met in the vicinity of the Meac sima, the Pallas rock, or the Goto islands, or when the two former have to be passed on dark nights. When, therefore, the vessel's position is uncertain, and the nights are not tolerably fine, it will be better to pass these islands or endeavour to make them in the daytime.

Should the wind be to the eastward of North, when leaving the Yangtse, as is frequently the case in the season of the N.E. monsoon, it is advisable to make northing at once, for which purpose advantage may be taken of the tides (page 428). As the ship advances northward, the wind will usually draw round in that direction towards N.W., which is the prevailing quarter of the wind in the Yellow sea; allowance must also be made for the south-easterly set from the Yellow sea and Korea strait.

During the periodic easterly and south-easterly winds which prevail from March to June, every opportunity must be made to make easting or southing, even when a fair wind occurs, for it is sure to be of short duration, and the tendency of the prevailing wind being to keep a vessel on the starboard tack, there is always a probability, especially in May and June, when the current will be running north-eastward, of being saddled over towards the Korean archipelago.

EASTERN ROUTES TO CHINA.†

During the N.E. or adverse monsoon, sailing vessels bound to China, instead of proceeding by the Palawan passage, sometimes take one of the eastern routes through the Moluccas, the Philipines, or the Pacific ocean, thus saving much wear and tear. There are two main routes. The *first eastern route* is through Macassar strait and the Celebes and Sulu seas into the China sea, with an alternative route into the Pacific, south of Mindanao, instead of the Sulu sea. The *second eastern route* is east of Celebes, and by Pitt's passage and either Dampier or Gillolo strait into the Pacific.

These routes are generally therefore adopted by vessels which reach the meridian of St. Paul island, in the Indian ocean, between the middle of September and the beginning of December.

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* *See also* page 23.

† From Becher's Sailing Directions, pages 187 to 199. There is another passage to China, called the *great eastern route*, which, though rarely used, is described at the close of this section, page 23.

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It may be here mentioned that the N.E. monsoon of the China sea, which prevails from October to March, corresponds with the N.W. or Westerly monsoon eastward and north-eastward of Java, and with a Northerly monsoon in the Molucca passages. Also, that the S.W. monsoon of the China sea corresponds with a S.E. or East monsoon in the former regions, and with a Southerly monsoon in the latter.* Further particulars of the winds of the eastern passages are given in the Appendix, page 680.

OCTOBER, NOVEMBER.—First Eastern Route.—These are the two most favourable months in which to pass the strait of Macassar quickly. In the other months it is more advantageous to take Pitt's passage, especially from December to February.

On arriving at the eastern straits in the latter part of January or February that of Lombok† is generally taken, crossing the channel east of Pandita island, and afterwards keeping the eastern side of the strait. The channel west of the island may be taken, but it is very narrow. From this ships pass to the eastward of Hastings island and little Pulo Laut, and the coast of Borneo, into Macassar strait.

From Allas strait a course should be steered to pass eastward of Hastings island, as if coming from Lombok. From Sapie strait, if in September and October, a ship would, according to the prevailing winds, pass east or west of the Postillions, and proceed to the north between Tana Keke and the Tonyn islands; then pass at a good distance the isles and banks of Spermonde, which are north-west of Macassar bay; and enter the strait, keeping on the Celebes coast whilst passing through.

Should Baly strait be chosen, ships after leaving it must steer to the northward and pass through Sapoedie strait east of Madura; then stand to the north-eastward at a good distance from the islands and banks of Kalkoon, and pass the little island of Pulo Laut on whichever side seems best.

Having passed Macassar‡ strait, a vessel making for the channel between Basilan and the west point of Mindanao must take care to keep well to the eastward, if the winds will permit, so that she may not be drifted

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* *See* Wind charts of the Pacific, Atlantic, and Indian Oceans.

† *See* Admiralty Charts:—Eastern Archipelago, sheet 2, No. 941 B; scale, $d=5\cdot7$ inches. Also, harbours and anchorages on Java coasts, No. 932; and Soerabaya, Baly, and Sapoedie straits, with anchorages, No. 934.

‡ *See* Admiralty Charts:—Macassar strait, north and south parts, No. 2,636 and 2,637; and Macassar road and ports in Macassar strait, No. 2,662.

Also, Sulu Archipelago, No. 2,576; and Basilan channel, No. 961; Sulo or Mindoro sea, eastern part, No. 2,578; St. Bernardino strait and adjacent islands, No. 2,577; and China Sea, northern portion, eastern sheet, No. 2,661 B.

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among the Sulu islands by the westerly currents. If she does get to leeward of them, good channels will be found between the isles situated to the west of Sulu; and then crossing the Sulo or Mindoro sea, the west coasts of Mindanao, Negros, Panay, Mindoro, and Luzon must be kept. At the opening of the channel between Mindanao and Negros, and also that between Panay, and Mindoro, strong winds from N.E.,* and westerly currents are generally encountered; it is necessary, therefore, to guard against these currents in passing from one island to another, so as not to be set to leeward.

If a ship leaves Basilan strait with steady winds from S.W. and South, she may either steer directly for the south point of Panay, or keep rather eastward of its meridian; but if the winds are variable and uncertain she should keep close to Mindanao till point Galera is reached, and then cross over, taking care to keep near Negros island.

From thence steer northward along the west coast of Panay, taking every precaution against the dangers which lie to the westward. She may then pass either east or west of the islands† lying southward of Mindoro, and enter Mindoro strait. If intending to take the channel east of the Apo shoal with easterly winds keep 2 or 3 leagues from the coast of Mindoro; but with a westerly wind take care not to go more than 9 or 10 miles from the coast until north of the Apo banks, thus clearing Mindoro strait; and after having doubled the promontory of Calavite, and passed Luban and Goat islands, the coast of Luzon must be followed up to cape Bolinao (Piedra point). Having reached this cape you may be pretty sure of passing westward of the Pratas, and fetching Macao, if not Hong Kong. But it is more prudent to make cape Bojeador before crossing for the coast of China. *See* also passage from Manila to Hong Kong on page 38.

Alternative Route from Celebes Sea.‡—But after passing Macassar strait, if not intending to pursue the route through the Sulu sea, a vessel may enter the Pacific between Celebes and Mindanao. To do so, if the wind permit, she will steer direct for the Sarangani islands off the south extremity of the latter, pass on either side of them, and then with the wind at N.E. endeavour to fetch between the Meangis and Tulur islands, in order to double the north cape of Morty. But if unable to take so northerly a route, she ought to pass through Siao passage, a channel reputed

* The N.E. trade-wind and drift current of the Pacific.

† *See* Admiralty Chart, No. 971.

‡ *See* Admiralty Chart, eastern part of the Celebes Sea, No. 2,575; Philipine islands and Moluccas, No. 943; and Luzon, northern portion, with the Bashee and Ballintang channels, No. 2,454.

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safe and lying between Siao and Tagulanda, high islands to the north-east of Celebes, or through other of the neighbouring Sangir channels, and then continue eastward so as to double the North cape of Morty. Having entered the Pacific, pass westward of the Pellew islands, and afterwards sail to the northward, so as to enter the China sea between Luzon and Formosa.

DECEMBER to FEBRUARY.—Second Eastern Route.—During the latter half of December, January, and February it is better to proceed by Pitt's passage, and thence by Pitt, Gillolo, or Dampier strait into the Pacific ocean, than to take the route by Macassar strait.*

If, as often happens, a ship pass through Sunda strait instead of by the south coast of Java, she would make for the strait of Salayer south of Celebes, and thence for Boeton strait; or, if the wind be westerly, pass south of Boeton island, and between it and Wangi Wangi, and thence, if the wind be fresh and towards the north-west, owards Xulla Bessy (Soela Besi) island north of Bouro. This is an indispensable precaution, for slow sailing vessels in December and the early part of January, because about this period the wind becomes variable, and veers to N.N.W. with strong southern currents. The winds and currents in Pitt's passage are very variable, and it may be crossed anywhere; it is prudent, however, when northerly winds prevail, to keep the weather shore.

In case of falling to leeward of the north-west point of Bouro (Boero), every exertion should be made to pass it quickly. Instead of working to windward to do this, it is better to run southward of the island, and pass into Pitt strait to the eastward of it. During the N.W. monsoon vessels which leave Amboina make to the northward along the east coast of Bouro, where the winds are variable and squalls come off the land, and currents are rarely strong and sometimes favourable for the run northwards; while beyond Manipa and the channel which separates it from Ceram, southerly currents prevail in this season. Having reached Pitt's passage the navigator will be guided by the directions given below.

By the Straits East of Java.—If proceeding by either the strait of Baly, Lombok, Allas, or Sapie, make for that of Salayer, crossing the eastern part of the Java sea and then proceed as above. Coming from the cape of Good Hope, Ombay strait is preferable, it being the most direct, and more open than those farther west, and the winds being generally less variable there. Enter it from the southward of Sumba, and afterwards

* *See* Admiralty Charts:—Eastern Archipelago, sheets 3 and 4, No. 942 A, and 942 B.

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steer to pass westward of Bouro into Pitt's passage, steering East; but if this be impracticable, pass eastward between it and Manipa as before directed. If no current be found westward of Bouro, then steer direct through Pitt strait; but if it be found setting to the northward, keep off the islands which border the northern side of the strait.*

By Dampier Strait.—Dampier strait separates the northern groups of the Moluccas from New Guinea. The passage into the Pacific by it seems favourable for good sailing vessels, especially in January and February, when northerly winds are getting more easterly; but in March, when those winds become weaker, the Gillolo strait is to be preferred, for it is wider, and a ship can work to windward both night and day in it, and the currents are seldom very strong.

On leaving Pitt strait, and also that of Dampier, you must take great care not to be drifted on the north coast of New Guinea, and should therefore endeavour to round point Pigot closely, looking out sharply for Buccleugh bank, which lies eastward of the east coast of Waygiou.

Pitt strait should only be taken when it cannot be avoided. In this case a ship should keep the middle of the channel to avoid being set to either side by the tides, and should therefore make short boards, not approaching either shore, and should try to make Jackson isle, and pass 5 miles to the northward of it. When she has passed the reef which lies E. by N. from the eastern extremity of Batanta island she must steer northward for point Pigot.

To enter Dampier strait, on passing the meridian of the east point of Obie Major, steer east to pass between the Canary islands and Pulo Popa. Sometimes vessels pass between the Boe islands and Pulo Popa (this last channel being advantageous with north-westerly winds), and then run for Fisher island off cape Mabo, and from thence pass between Pigeon island and Foul island, and steer to sight Pigot point, so as not to be horsed on to the coast of New Guinea by the northerly swell which prevails in the offing. The Buccleugh bank must be carefully avoided.

Tides in Dampier Strait.—The tides are very strong in Dampier strait, and the currents very irregular, their rates varying from 1 to 5 miles an hour. In the height of the N.W. monsoon, in the narrow part of the strait between Pigeon isle and Foul isle, the ebb at springs runs 4 to 5 knots to the E.N.E. for 6 or 8 hours, and between 1 and 3 knots at neaps. The flood sets S.W. for 3 or 4 hours, but is weak. During the height of the S.E. monsoon in this part the flood runs West for 8 or 10 hours at a time, and turns successively W.S.W., S.W., and S.W. by S.; it then attains

* *See* Admiralty Plans:—Anchorages in Celebes, No. 931; Anchorages in the Moluccas, No. 930.

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its greatest velocity; which at springs sometimes exceeds 5 miles an hour, and is reduced to 4 knots at neaps. The ebb at this season runs E.N.E. or N.E.; it is not strong, nor of long duration.

Dampier Strait to China.—On leaving Dampier strait, when a ship is in the Pacific, she should run down her easting quickly, keeping in a low latitude or between the parallels of 1° 30′ and 3° N., which she can easily do, sometimes even in December and January. She will thus be enabled conveniently to pass either east or west of the Pelew islands, but this depends on the sailing powers of the ship and the strength of the N.E. monsoon. A vessel must not go far to the eastward for fear of falling in with the islands of Ngoli or Goulou and Yap or Guap, near which, in November and December, heavy squalls from the westward are encountered. From the Pelew islands steer for the Bashee islands, allowing for the westerly trade drift-current, which runs at the rate of 12 to 15* miles a day. From December to the middle of February it is more prudent to pass east of the Pelew islands.

Should a vessel leave Dampier strait towards the end of the N.E. monsoon, she should not run far east into the Pacific. At the end of February and in March ships can pass westward of the Pelew islands, as the winds at this time often vary and shift to E.N.E. When the north part of Luzon is reached the China sea can be entered by either the Bashee or Balling-tang channels. But at the commencement of the monsoon it is necessary to pass north of the Bashee islands, approaching the coast of Formosa, and it is best with daylight and fine weather to pass between the south cape and Vele Rete rocks. During the night or in bad weather, if prevented from taking this route, a vessel should pass close north of the Bashee islands. Whichever may be the channel by which the China sea is entered, a course should be adopted to sight, if possible, Pedro Blanco, so as to be sufficiently to windward to take either the Tathong or Lema channels.

By Gillolo Strait.—The wide strait west of Gillolo and north of Pitt passage is divided into two by the island of Geby, and the part between Geby and Gillolo is called Gillolo passage. The other part, between Geby and Waygiou is Bougainville strait. All the channels leading from Pitt's passage to Gillolo strait are free of danger; but in the N.W. monsoon that between Pulo Gasses and Kekik island is preferable as being the widest, for the other broad channel between Pulo Pisang and the Boe islands is too much to leeward at this season. To enter Gillolo passage between Gasses and Kekik, sail closely round the southern point of Gasses, so as not to miss

* According to the Admiralty current chart, it runs 18 to 30 miles a day, increasing to 24 to 42 near Luzon and Formosa.

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the channel by the drift of the easterley current which often prevails there. After passing either east or west of Pulo Gasses, continue on between cape Tabo and Geby island, and, if at night, give a good berth to Weda island. However, it is prudent, when the wind is light, to keep as close as possible to the islands on the west side of the strait on account of the N.E. and easterly currents. Should the winds be contrary, every endeavour should be made to get to the north of Geby as quickly as possible, afterwards passing southward between it and Gagy, and entering the Pacific by one of the channels near Syang. However, when it can be done, the west channel between Gillolo and the Shanpee isles, or one of those comprised between these and Syang, is preferable, as with a northerly wind a ship would be able to pass to windward of Aiou and Asia islands. Should there be any difficulty in passing west of Asia iles, the channel which is formed by them and Aiou can be adopted, or even between this latter and the north coast of Waygiou. Having gained the Pacific, endeavour to make easting as quickly as possible between the parallels of 1° 30′ and 3° N., taking care not to get north of the latter parallel; and so attain the latter part of the route, above described, on to China.

GREAT EASTERN ROUTE to CHINA.—This route has been adopted with great success when the cape of Good Hope has been left in September.

From south of the Cape, a vessel should steer East, keeping between the parallels of 33° and 40° S., or thereabouts, as far as the meridian of cape Leeuwin, Australia. From thence one of two routes may be taken, that south of Tasmania, or that by Bass strait.

The first was adopted by Captain Butter of the ship *Walpole*. He left the cape at the end of September; on the 31st of October he sighted the south-west point of Tasmania; on November 18th he sighted the island of Aneiteum, one of the new Hebrides; he left these islands a little to the west, crossed the equator in long. 161° 40′ E., and crossed the archipelago of the Carolines. On December 21st he passed the Marianne islands; on the 30th he entered the Bashee channel, and anchored at Macao on January 1st.

Thus the voyage lasted three months; that is, it occupied only little more than the time that, without steam, is generally taken in making a passage by the direct route to China against the N.E. monsoon.

The passage by Bass strait was taken by the *Athenian* in 1804. On the 11th of October she passed Amsterdam island; entered Bass strait on the 28th of October; passed west of New Caledonia and the Hebrides, and then between these latter and the Solomon isles. She crossed the line in 160° E. long., and sighted the coast of China on the 28th of December.

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Although the latter route is somewhat shorter, it was the opinion of Krusenstern that the passage south of Tasmania is preferable. His opinion was founded on meeting westerly winds in high latitudes, and that by passing south of Tasmania, northerly winds and southerly currents, often met with at the entrance of Bass strait, are avoided.

ROUTES BETWEEN AUSTRALIA AND CHINA.*

There are four different routes for ships bound from the province of New South Wales to China; three of these routes are to the eastward of New Guinea, and one (the well-known Torres strait route) passes to the westward of that great island.

These routes are herein styled respectively, the Eastern, the Middle, the Western, and Torres strait routes.

EASTERN ROUTE.—This route follows a line from Newcastle (or from Sydney) to Norfolk island, thence to Matthew island, and north along the 171st meridian to 11° S., then N.N.W. to Pleasant island, crossing the Equator in 166° E., and through the eastern part of the Caroline islands to the ship's destination. The length of this route is—

From Newcastle	to Hongkong	- 6,150 miles.
„	to Shanghai	- 6,000 „
„	to Yokohama	- 5,500 „

Ten vessels have adopted the Eastern route, their average passage being 64 days; the shortest passage, 49 days, was made in the *Zenobia*, which ship left Newcastle April 2nd; the longest passage, 74 days, was made by the *Windhorn*, which ship left Newcastle December 21st.†

MIDDLE ROUTE.—This route is from Newcastle (or Sydney) midway between Lord Howe island and the Elizabeth reef, to the D'Entrecasteaux reefs on the north-west extreme of New Caledonia, and thence between the Solomon and Santa Cruz islands to the Equator, which is crossed in 159° E.; thence through the middle of the Caroline islands, when a course may be shaped for the destined port. The length of this route is—

From Newcastle	to Hongkong	- 5,500 miles.
„	to Shanghai	- 5,400 „
„	to Yokohama	- 4,900 „

Twenty-nine vessels have taken the Middle route, their average passage being 48 days, or 16 days less than that of the Eastern route. The

* From data collected by Staff Commander T. H. Tizard, H.M.S. *Challenger*, 1874; and derived chiefly from an analysis by Captain Allen, Harbour Master at Newcastle, New South Wales, of passages made by sailing vessels during the years 1869–1873.

† H.M. Steam Troop-ship *Adventure* made the passage by the Eastern route, from ydney to Hongkong, in 45 days, during the months of November and December 1874.

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quickest passage made was by the *Thermopylæ*, which ship left Newcastle on February 10th, and arrived in Shanghai on March 10th, or in 28 days. The longest passage recorded is of 65 days, the same as the average passage by the Eastern route; this was made by the ship *E. J. Spence*, which left Newcastle in April.

WESTERN ROUTE.—This route from Newcastle is N.E. to the 157th meridian, and due north on that meridian to the latitude of the Pocklington reef in 11° S., thence either to the north-westward between New Ireland and the Solomon group, or to the northward through the Bougainville strait, between Bougainville and Choiseul islands, crossing the Equator in about 153° E.; from this position a straight course may be shaped for either Shanghai or Yokohama; but for Hongkong the course is through the western part of the Caroline islands, thence to the Balintang channel. The length of this route is—

Newcastle to Hongkong	-	5,000 miles.
„ to Shanghai	-	4,900 „
„ to Yokohama	-	4,600 „

Five sailing vessels and one steam vessel have used the Western route: the steam vessel made the passage in 23 days to Shanghai. The average length of passage of the sailing vessels was 48 days, being the same as the Middle route; the shortest, 34 days, having been made in April by the *Enie*, and the longest, 75 days, in July by the *Helen Malcolm*. In the same month, however, another vessel, the *Woodlark*, made the passage in 39 days.

TORRES STRAIT ROUTE.—The fourth or Torres strait route is also from Newcastle, N.E. to the 157th meridian, then north on that meridian to the latitude of the Mellish reef, and N.W. for Bligh's entrance to Torres strait. When through Torres strait the route is between the Tenimber and Arrou islands, and by the passage between Ceram and Bouro into the Molucca channel, then round the north-east end of Celebes island into the Celebes sea, through the Basilian channel into the Sulu sea, and through Mindoro strait into the China sea. The distance from Newcastle to Hongkong by this route is 5,300 miles, and it has been taken by only one ship, the "*England*," which made the passage in 41 days, in the month of July.

A careful study of the statistics of these voyages in conjunction with the Wind and Current charts for the Pacific, Atlantic, and Indian oceans, published by the Admiralty, lead to the following conclusions; it being observed that the data alone supplied by these voyages has been dealt with.

During the months of January, February, and March, the average passage by the Eastern toute was 62 days; the longest recorded being 66 days, and the shortest 57 days.

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The average passage by the Middle route was 40 days; the longest recorded being 45 days, and the shortest 28 days.

It would appear, therefore, that the Middle is the proper route for vessels leaving Australia in January, February, and March.

It is well known that from the prevalence of the westerly monsoon in Torres strait and to the eastward of New Guinea, neither the western nor Torres strait routes are suitable during the first three months of the year.

During the months of April, May, and June only one passage was made by the Eastern route, viz., in April, the time occupied being 49 days.

The average passage by the Middle route was 57 days; the longest recorded being 65 days, and the shortest 49 days; whilst during the same three months two passages were made by the Western route, one in 34 days, the other in 38 days, or an average of 36 days. No passage is recorded in these months by the Torres strait route.

The Western route seems in this case to offer the greatest facilities for making the passage, for ships leaving Australia in April, May, or June.

During the months of July, August, and September two vessels took the Eastern route, each ship making the passage in 61 days. The average passage by the Middle route was 54 days; the longest recorded being 64 days, and the shortest 41 days. The average passage by the Western route was 55 days; the longest recorded being 75 days, and the shortest 39 days; whilst one passage was made by the Torres strait route in 41 days.

It appears certain that in these months a better passage will be made by following the Middle rather than the Eastern route to China, the question as to which is the most advantageous track rests therefore between the Torres strait, the Middle, and the Western routes.

If a ship leaving Australia can enter Torres strait before the end of August this route will be found the best to take; if, however, she cannot get through Torres strait by that time, she should adopt either the Western or the Middle route; probably the Western will be found the quicker if every means are taken to get north after crossing the Equator until the 10th parallel is reached; as the vessel which was 75 days on this voyage wasted a fortnight in trying to work to the westward against light N.W. winds when between the Equator and 5° N. latitude.

During the months of October, November, and December the average passage by the Eastern route was 67 days; the longest recorded being 74 days, and the shortest 60 days. The average passage by the Middle route was 44 days; the longest recorded being 49 days, and the shortest 39 days. No passage was made at this season of the year either by the Torres strait or Western routes.

Much depends on the sailing qualities of the vessel, but as a general rule, ships leaving Australia in the months of January, February, or March

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for China or Japan should adopt the Middle route, and may expect to make the passage in about 40 days; leaving in April, May, or June they should adopt the Western route, and may expect to make the passage in about 36 days; leaving in July, August, or September they should, if they can reach Torres strait before the end of August, take that route; and if not, either the Western or Middle route, and may expect to make the passage viâ Torres strait in 40 days, and by the other routes in 55 days; and, finally, ships leaving in October, November, and December should adopt the Middle route, and may expect to make the passage in about 44 days.

The passage to China, southward of Australia, is only practicable for sailing vessels during the months of December, January, and February, as easterly winds may be then expected. This route, however, is not recommended, even if not bound northward of Singapore, for during the months of November, December, January, February, and March northerly winds and southerly currents prevail in Sunda, Banka, Gaspar, and Carimata straits, and it is a tedious process endeavouring to get to the northward under such adverse circumstances. A vessel has been known to take 30 days from Sunda strait to Singapore, a distance of 500 miles.

Viewing the different tracks in regard to their freedom from danger there is little doubt that the Eastern route is the clearest. The Middle route, however, is nearly as free from difficulty as the Eastern.

The Western route is at present the least known; the passage, however, between the Soloman islands on the east and the Lousiade archipelago and New Ireland on the west, is wide, and apparently free from danger (with the exception of the Pocklington reef), and in April, May, and June, during which months ships gain the greatest advantage by using it, the weather is fine; so that there seems nothing to deter vessels from taking this track, provided a good look-out is kept.

The Torres strait route, although not free from danger, may be navigated with facility by captains who have had experience amongst coral reefs, and accustomed to conn their vessels from the masthead, the latter a precaution absolutely necessary. When through Torres strait there are few dangers on the track to China, as although islands are in some cases doubtful in position, they are of sufficient height to insure being readily seen.

HOMEWARD ROUTES FROM CHINA.

In the S.W. Monsoon.

The adverse voyage against the S.W. monsoon is best followed by adopting one of the ensuing routes, according to the time of departure from the ports of China.

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CAUTION.—The utmost care is necessary in the navigation of Sunda strait since the recent tidal wave, and volcanic disturbances in that region; which, though apparently not having materially altered the *main* channel, have made sufficient changes, in the smaller passages, to render their navigation dangerous until re-surveyed.

MARCH, APRIL.—By Palawan Passage. — Vessels leaving the coast of China or Manila, and bound towards Sunda strait, in March, April, or in the early part of May may expect a tedious passage down the China sea if proceeding by the old route which passes Pulo Sapatu, particularly if they do not sail before the 5th or 10th of April.

Whereas if the track be taken along the coast of Luzon, down the Palawan passage, along the coast of Borneo, past Direction island, round Sorueton, and through the Carimata strait, passing close round the North Watcher, and on for St. Nicholas point in Java, they are likely to carry easterly winds, with fine weather, and a smooth sea the whole distance, thus making a direct course, and will avoid calms. The current will also be more favourable than otherwise until May is well advanced.

In approaching Sunda strait the Java side should be steered for, and kept aboard in May, as then the winds are light, those from south-east prevailing at night, and from north-east during the day. This precaution will prevent the vessel being carried by the current to the westward of the Button islet. This current runs constantly to the south-west in the middle of the strait; it is checked by the short flood, but runs strong with a long ebb.

With reference to the above directions for making the passage from China, and to prove the advantages of this easterly route, it may be stated that, in April 1861, two American ships sailed from Fu-chau-fu; one proceeded by Pulo Sapatu on the west side of the China sea, the other by the Palawan passage and Carimata strait; the latter ship passed Anjer twenty days before the other.

The *Harkaway*,* on her passage in April and May 1862, carried an easterly wind the whole way down, and had no occasion to anchor.

APRIL. MAY.—By the Sulus and Celebes Seas.†—Quitting Hong Kong or the Canton river at the end of April or beginning of May for Mindoro strait, a ship should run as far south as the Macclesfield

* Captain David W. Stephens, who is the author of the foregoing directions, received through the Meteorological Department of the Board of Trade. *See* Admiralty Charts:—China Sea, Nos. 2,660 and 2,661; Eastern Archipelago, No. 941A; also "China Sea Directory," Vol. ii., Chapter I.

† From Becher's Sailing Directions. This is therein named the "First Eastern Route."

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bank, if the wind allow, so as to fetch the north-west extreme of Mindoro without tacking in case of the wind shifting to S.W. From near the Macclesfield she should stand S.E., holding her wind if it is at all to the S.W.; and should it not admit of her weathering Calavite point she should work along the coast of Luzon, where with variable winds she will come up to the north-west extremity of Mindoro.

The channel eastward of Apo bank should be chosen for passing Mindoro strait, giving the Mindoro coast a berth of some miles if the winds be variable, but if the south-west wind be steady a berth of 9 or 10 miles is necessary ; she will then pass the islands of Ambolon and Ylin at a distance of about 15 miles.

Should the wind allow, the strait of Mindoro may be crossed, passing west of the Apo bank in the Northumberland channel formed by this bank and the Calamianes. Then keep along the coast of Panay, working, if necessary, at some distance from this island, according to circumstances ; and the island of Quiniluban may be neared when passing the dry sand-bank between it and Panay.

Having reached the south cape of Panay, stand for Basilan strait, making it well to the southward and eastward should the wind be to the westward, but steering direct for it if the wind be easterly. The S.W. extreme of Mindanao being gained, it will be better to take Basilan strait than any of those formed by the Sulu islands to the south-west, it being the shortest route ; the Celebes sea will then be entered, and the ship will make for the strait of Macassar.

Instead of persevering in working against S.E. winds at the entrance of Basilan strait, it may be better to steer to the south-westward, in order to pass west of the Sulu archipelago, between Unsang the east point of Borneo and Tawi-Tawi island. There are two small islands bearing S.S.E. of the south-west point of the latter, between which and Sibutu island, is a good channel leading direct into the Celebes sea. This channel is safe, and easy of navigation both by night and day, four hours sufficing to pass by it from sea to sea, while under similar circumstances it has sometimes occupied four days in going from one sea to the other by the strait of Basilan. The Sibutu passage, however, is not so easy of access as Basilan strait, for it has to be approached through a dangerous archipelago.

To leave the Celebes sea, take either the Macassar strait or the Molucca channel. Some navigators prefer the latter when the S.E. monsoon prevails north of the equator. In fact, it is difficult, without a tedious passage to windward, to reach Allas strait from the strait of Macassar ; while by taking the Molucca channel the S.E. monsoon is found in a latitude sufficiently to the eastward to enable you to take whichever eastern channel is preferred. But vessels bound to Batavia or Sunda strait will find Macassar strait the better.

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On leaving Basilan strait, if the easterly wind is well established, steer so as to make cape Dondo to the S.S.E. or South; but most generally, from the winds veering westward near the north entrance of the strait, and the current setting eastward, it is more prudent to keep as much to the westward as possible in order to sight point Kaniongan on the coast of Borneo. Off cape Rivers, the north-west point of Celebes, a ship is sometimes set to the eastward by the current* along the north coast, and, after fruitless contest with it, is sometimes obliged to stand away eastward for the Molucca channel.

Having entered Macassar strait, keep along the west coast of Celebes, passing eastward of the little Paternosters, and taking care of the Laurel reef north of the Noesa Siri islands when passing Pulo Laut on the Borneo side. Thence steer for Allas strait or one of the other straits leading into the Indian ocean. But if bound to Batavia or Sunda strait from Macassar strait, if the wind permit, steer so as to pass north of the Little Paternosters, and keep along the coast of Borneo, guarding against the dangers off it, as well inshore as to seaward. Then entering the Java sea, Batavia or Sunda strait can be reached without difficulty.

A ship taking this route, and meeting with contrary winds from Basilan strait, so as to be unable to reach Macassar strait, may take the Molucca passage, and should then steer for the islands near the N.E. end of Celebes; and passing between the islands of Banka and Bejaren, will clear the N.E. point of Celebes, and then steer to the southward through the channel formed by Lisamatula, the eastern point of the Soela or Xulla islands, and Obie Major, which is the most frequented; or if the wind should not permit her reaching it, should take the Greyhound channel between the islands Albion and Hammond, west of Xulla Taliabo.

When it is found difficult to get to the southward in the Molucca channel, dull sailing vessels might try to do so by keeping near the west coast of Gillolo; thence they might enter the strait of Patientie between Gillolo and Batchian, or the strait of Batchain, formed by the island of same name and Tawally and Marigorang.

However, a ship having reached the northern extremity of Gillolo or Mortie in the height of the S.W. monsoon, should rather pass through Gillolo channel than that of the Moluccas, because it leads more directly to Pitt's passage, by which she can gain the eastern straits.

On leaving the Molucca channel, the Timor strait or Ombay passage may be adopted. The shortest route from Pitt's passage to the Indian ocean during this season is then as follows. A ship should pass close by Obie Major, in order easily to round the east coast of Bourou, and so pass between Bourou and Manipa. She would then run to the southward into the Banda sea, where the wind is generally E.S.E.; endeavour to pass east-

* Captain Spratly.

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ward of Ombay, and having crossed the channel between Ombay and Wetta, would follow the west coast of Timor, and enter the Indian ocean between Semao and Savu.

MAY, JULY.—By the Pacific Ocean.—This route, which is adopted from the middle of May to the end of July, lies by the Pacific Ocean east of the Philipines, and through Pitt's passage.

August is too late to take this route, and a ship obliged to leave the south of China then, should follow the coasts of Cochin China and Cambodia as before directed, unless she be a bad sailer, when it will be better to defer her departure till September.

With south-westerly winds, a ship, to past east of the Philipines, should steer as southerly a course as possible, in order to enter the Pacific without tacking, and if the wind admit, the Ballintang channel should be adopted. In the Pacific at this season S.W. winds will generally be found with north-westerly currents ; she should therefore steer S.E. to avoid cape Engano, tacking if necessary, so as to pass neither too far out nor too close ; and be careful not to round the Pellew islands farther to the eastward than is necessary.

For making southing, the best route is then east of the isles of St. Andrew and Pulo Mariere. If the equatorial counter-current be met, it may not be strong as far as the Pellew islands; but between the parallels of 7° and 3° N. lat., it sets at the rate of 30 to 60 miles a day. This part must therefore be crossed as quickly as possible if the wind be West, as it frequently is ; for if light winds prevail a ship may be set far to the eastward by this current. But from the lat. of 2° N. to the equator a westerly current will be found, while near Dampier strait it is again found running to the eastward.

Having rounded the eastward of St. Andrew, a ship should endeavour to keep between the meridians of 132° and 133° E., and when in 1° N. lat., if Dampier strait is to be taken, she should make for point Pigot.

Gillolo passage being broader than Dampier strait is often preferred for that reason, and there are few difficulties in it to be overcome in reaching Pitt passage. When it is adopted, on leaving the parallel of 2° N., the Asia isles should be steered for, and rounded on the north if the wind permit, unless passing between them and Aiou.

Having passed the island of Syang, and north or south of Geby island, if the weather be not favourable Gillolo strait may be taken instead of Bougainville, which is south of it. In passing Gillolo strait keep near the eastern coast, and enter Pitt channel between Pulo Pisang and the Boe isles, or else, according to circumstances, between Kekik and Pulo Gasses.

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A vessel entering Dampier strait should round point Pigot at a distance of 6 to 12 miles, and then steer for King William island, keeping it west of her; when about 9 miles from it she should steer for Pigeon island, and pass 2 or 3 miles south of it; she may then cross the strait, taking care to avoid any dangers in her way.

On leaving Dampier strait she would go close round cape Mabo, so as if possible to pass south of Pulo Popa; or she may pass north of this island and enter Pitt channel between the Boe islands and Pulo Popa. In Pitt channel she should keep mid-channel, bearing rather on the southern than on the northern side. Passing between Ceram and Bouro, the Indian ocean may be entered by the strait of Ombay, or one of those westward of it.

Ombay strait is the most direct route to the Indian ocean in the S.E. monsoon, and may be gained as above directed. But if intending to take the strait of Salayer, or either Allas or Sapie strait, the north-west part of Bouro should be made, and thence the most northerly of the Toekan Besi group should be rounded at 2 to 3 miles, and after rounding Celebes the course should be directed for the strait of Salayer.

The foregoing is a general account of the tracks most usually followed in traversing the China and adjacent seas. The more particular instructions for each locality (excepting the eastern passages) will be found in their respective places in the following pages.

In such a variety of routes, it has been well remarked,* there is necessarily some diversity of opinion as to which is best, and this has not been lessened of late years by the improved build and trim of the vessels employed in Oriental commerce, and the more frequent use of steam power. The route practicable and advantageous to the swift sailing clipper or the steamer, cannot be followed by the heavy-laden and slow-sailing ship of former years. In what is here given, these different routes are each described, some from older authorities, some from recent experience. Some few of the best tracks may have been avoided from ignorance of their nature, or their supposed dangerous character. This is fast disappearing before increased knowledge, and it may be predicted that some settled system for the navigation of these seas will be established in the course of a few years.

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* Alex. Geo. Findlay, Esq., F.R.G.S.

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TREATY PORTS OF CHINA, &c.

The following ports in China and Japan have been opened by treaty to the subjects of Great Britain and other foreign nations. Regulations which every foreigner is required to obey, are to be seen in the public office of every consulate.

HAÏNAN ISLAND (North Side).—Kiungchow, with the port of Hoihow.

SOUTH and EAST CHINA.—Pakhoi, Canton, with the port of Whampoa; Swatow for Chau-chu-fu; Amoy; Fuchau fu (Foo-chow), with Pagoda island; Weñchow and Ning-po.

On the YANGTSE KIANG.—Shanghai; Ching-kiang; Kiu-kiang; Hankow; Ichang; and Wuhu.

NORTHERN CHINA.—Chifu (or Yentai); Tientsin, with the port of Taku; and Newchwang with the port of Yenkoa or Yingtze.

FORMOSA.—Taiwan fu, with the port of Takau; and Tamsui, with the additional port of Kelung.

JAPAN ISLANDS.—Yedo (Tokio), with the port of Yokohama; Osaka, with the port of Kôbe; Nagasaki; Nîgata; and Hakodate.

The descriptions of the above ports (excepting those of Japan which are contained in the fourth volume of the China Sea Directory) will be found in various parts of the body of this work, and besides the directions for navigation, embrace their climates, trade, supplies, docking accommodation, port regulations, and other useful information.

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CHAPTER II.

APPROACHES TO HONG KONG AND CANTON.

WITH MACAO, CHU KIANG OR CANTON RIVER, SI KIANG OR WEST RIVER, AND WESTERN CHANNELS OF CANTON RIVER.

VARIATION IN 1884 Hong Kong 0° 35′ E.

As vessels bound to Canton river from the southward in the S.W. monsoon endeavour to make Great Landrone island* bearing about North, and then proceed towards the river by the Great West channel, a description will first be given of the islands and anchorages on the west side of this channel, from San-chau island to Cum-sing-mun harbour, including Macao and its approaches, also the estuary of the Si kiang or West river, called the Broadway, and then returning to the Ladrone islands the mariner will be taken through the different passages eastward of these islands to the entrance of the river and to Hong Kong, as follows:—

The Ladrones and contiguous groups which form an outer belt of islands fronting the entrance of the Canton river are described on p. 74; Tylo and other islands forming an inner belt, on p. 78. Next the Lema islands and the great chain extending south-westward from them, through which the western entrance to Hong Kong is approached from the southward, are described at p. 81; the islands bounding that approach, called the Lamma channel, at p. 84; and Hong Kong on p. 86.

Next are described the great island of Lantao and the adjacent coast forming the inner channel between Hong Kong and the Canton river at p. 94; followed by directions to Hong Kong or the Canton River by various other channels, viz.: through Lema channel, p. 99; through Tai-tami channel, p. 102; to Canton river through Lantao channel, p. 100; through Great West Channel, p. 102; Lintin to Boca Tigris, p. 104; and through Fansiak channel, p. 107.

The chapter concludes with descriptions of the Canton river, p. 108; the western branches of the same, p. 127, and the Si-kiang or West river, p. 134.

* *See* Admiralty Charts:—East coast of China, Sheet I., No. 2,212; scale, $m = 0{\cdot}23$ of an inch. Also, General Chart of Canton river, No. 2,562; scale, $m = 0{\cdot}46$ of an inch.

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APPROACHES TO MACAO.

SAN-CHAU, which forms the west side of entrance to the Broadway, is the next large island north-eastward of Tylou island, and its south-east point bears W. by N. 15¼ miles from the Little Ladrone. The space between San-chau and Tylou is shoal, with some islets and rocks adjoining the north-east end of the latter. The depths decrease gradually off San-chau, but it is not so bold to approach as the islands to the south-westward, for soundings of 3 to 4 fathoms extend a considerable distance from it; nearly touching its east point is a conical islet and some rocks, with 3 fathoms close to.

MONTANHA, or Wung-cum island, forming the east side of entrance to the Broadway, is a large high island N.E. of San-chau, and close to its north-east side is Ko-ho island. These two islands form the south side of the Typa anchorage; and the Great West channel is bounded by them, on the west, and by Potoe and the other islands adjacent on the east.

The BROADWAY is the chief and eastern entrance (and the only one yet surveyed) of the Si kiang, described in page 134. It has sufficient depth to admit a vessel of moderate draught a considerable way up, and may be found useful to such as intend to make a long stay near Macao, or to those who have parted from their anchors, and draw too much water to attempt the Typa anchorage off Macao. Its entrance is 9 miles south-westward of Macao, between the islands of San-chau and Montanha. The channel, a mile wide, takes a N.N.W. course for 15 miles, with average depths of 16 to 21 feet between flats carrying 3 to 9 feet. There is a 12-feet shoal patch in mid-channel, between two rocks awash at low water, 4 miles within the entrance.

WATER ISLANDS are two small islets lying close off the south end of Montanha; and N.W. ¾ N. a mile from them lies Inside islet, having a small inlet, called Lark bay, between it and Morgan point (608 feet above the sea), the west extreme of Montanha. These islands are on the east side of the Broadway entrance; and Coffin island, bearing S.W. by W. ¼ W. distant 4 miles from the Water islands, is on the western side. At 5 miles in a S.W. direction from Montanha peak, and 2½ miles from the Water islands, is a shoal patch of 12 feet.

TIDES.—It is high water, full and change, at the entrance of the Broadway at 11h., and springs rise 7½ feet. The neaps are very irregular, there being then only one flood and one ebb of any considerable strength during the 24 hours. The direction of the flood outside is governed principally by the winds; with strong easterly winds it comes from E.S.E., and when south-westerly winds prevail from South. The ebb

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runs generally to the S.W. Inside the river the tides take the direction of the channel.

DIRECTIONS.—The best time to enter the Broadway is with the first of the flood, and if at anchor in Macao road and obliged to run for it with a N.E. or East wind, about three-quarters ebb will be the best time to leave the road, that the first of the flood may be met at the entrance, where it flows sooner than in the road. Having rounded the east point of Ko-ho island, about 1½ miles distant in 4½ fathoms, steer at any convenient distance round Apomi point, the high south-east extreme of Montanha, which has 3 fathoms near it, deepening gradually to the eastward towards Potoe island.

When abreast the point, Water islands will be seen in one with each other, near the western extreme of a bay with a sandy beach. As there are not more than 2 fathoms in this bay at low tide, it should be avoided by steering to pass about half or three-quarters of a mile southward of these islands, in 2¾ or 3 fathoms, then haul round the western island, preserving the same depth and distance. Do not exceed the distance of one mile westward from this island, for beyond that the water shoals fast to 2¼ fathoms towards the San-chau shore. From abreast the islands about a N.N.W. ½ W. course, giving a berth of three-quarters of a mile to Inside islet, will lead up to abreast Morgan point, the west point of Montanha, in 3 and 3¼ fathoms at low water, off which a vessel may anchor in a gale and be sheltered till its termination.

From the above point the water shoals gradually towards Ross island on the west side of the channel; there is generally a line of fishing stakes extending westward from the point, with passages among them for vessels.

MONG-CHAU, or Ballast island, bears N.N.W., 2½ miles, from Morgan point, and between them are two passages leading to Macao, but both so shoal at low water as only to be fit for boats.

N.W. ¾ N., about 1¼ miles from Morgan point, and fronting the first of the above passages, is a rock which shows at low water about the size of a small boat. The channel is about a cable westward of this rock, for W. ¼ S. about a mile from it is another rock, which also shows at low water, and shoal banks bound the channel on both sides. From Morgan point to Ballast island the water is shoal; a narrow passage eastward of the eastern rock has 1½ fathoms at low water. Pak-tang, a small island with a sharp hummock on its north-east end, lies on the western bank, W. ½ N. distant 3 miles from Ballast island; the bank, composed of mud, has only 6 feet on it, and extends 1½ miles from Pak-tang towards Ballast island, and commencing at the western rock, trends to the N.N.W. the whole length

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of the channel, contracting it to about the breadth of half a mile to a mile, with 2¾ and 3 fathoms in it.

If intending to proceed farther up than Morgan point steer N.N.W. towards the rock fronting the first passage to Macao; the soundings will be about 3 fathoms at low water, and the rock should be passed within a cable on the west side, to avoid the 12 feet shoal patch in mid-channel. When abreast the rock, steer N.N.W. ½ W. 1½ miles, and the vessel will then be abreast Ballast island, in 2¾ fathoms. This is a safe and convenient anchorage, about 6 miles S.W. by W. of Macao, and the boats are kept in sight when passing to or from that place. Fresh water may be obtained in a small bay to the northward, under Beacon hill, which is 690 feet high, and has a remarkable stone on its summit.

The channel for vessels, between Ballast island and the bluff point to the northward, becomes narrow. If intending to proceed higher up a N.N.W. ½ W. course will lead about a mile above the bluff point, in 3 and 3¼ fathoms, and this point ought to be passed at about three-quarters of a mile. If drawing more than 14 feet, wait here for the last of the flood, to pass the Tang rocks, lying a little to the northward, and off which are only 3½ or 4 fathoms at high water.

From the bluff point, steer N.N.W. ¾ W. to pass a three-quarters of a mile westward of the Tang, and when abreast them, steer about N.W. ¾ N., or directly for the entrance of the river, keeping about half a mile off Nam-ye-kok point, which forms the east side of entrance; it has a Joss-house on it, and is well covered with trees. Here the depths begin to increase, and passing Moto fort, keep within a quarter of a mile of it, to avoid a rock lying in mid-channel; the soundings will be 4 and 5 fathoms. (For the navigation of the Si kiang see page 134.)

If the wind does not admit sailing directly into the entrance of the Broadway, there is room for short tacks between the Water islands and the rocky islets off San-chau, taking care of the latter shore, which is shoal. Farther in, the channel contracts a little, but the tides are of sufficient strength to back and fill past the rocks that lie at the entrance of the passage to the Typa, or where the channel may seem rather narrow for working. The wide opening eastward of the Tang rocks, called the Flats, has a boat passage through it leading to Macao.

TYPA ANCHORAGE.—The eastern entrance to this anchorage is between two high islands, that on the south side named Ko-ho or Apomi, and that on the north side named Typa or Kuikong. Ko-ho is separated from the north-east point of Montanha by a narrow gut with 19 feet water in it, decreasing to 9 or 10 feet farther in towards the Typa. The anchorage is between the west end of Typa island and the east end of Macarira island, and affords secure shelter in 3½ to 4 fathoms. H.M. Ships

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Herald and *Modeste* refitted here during the operations in China in 1841.*

TIDES.—In this anchorage, and in Macao harbour, it is high water, full and change, at 10h. 0m. The springs rise 10 feet; in the Typa they run 1½ and 2 knots per hour, when not influenced by the winds. The ebb runs out of the Typa entrance, but it sets across it when outside the points.†

DIRECTIONS.—Vessels entering or leaving the Typa should weigh at half-flood. In entering steer for the north extreme of Ko-ho, and pass it pretty close, the deepest water being on this side the entrance. Thence continue in mid-channel for Juan point, and when Village and East points of Typa island are in one, haul to the northward, and anchor near the west point of Typa, with south point of Tylock open of south extreme of Typa.

Here the depth is 3¼ to 4 fathoms at low tide, and vessels are sheltered from all winds by the high lands around; the deepest water is near the west point of Typa (on which is a fort), the bay abreast, at the east end of Macarira, being shoal. The watering cove is at the head of this latter bay, and from the north point a reef of rocks, with the sunken rock Pedra Mea, projects nearly a quarter of a mile eastward. In the fair channel leading to the anchorage the depths are only 8 to 10 feet at low tide; but no injury can be received by grounding, the bottom being remarkably soft.

MACAO HARBOUR.—Macao,‡ a Portuguese settlement in China, stands on a small peninsula projecting from the south-east end of Hiang-shan island. The peninsula is nearly 2 miles long, less than a mile wide at its broadest part, and is connected with the island by a low, narrow, sandy isthmus, across which extends a barrier wall to exclude foreigners from the interior of the island. The town is built on the declivities of the hills which surround the harbour and are 200 to 300 feet in height, the shore beneath being embanked, so as to form a marine parade, backed by a terrace of white houses.

This settlement, known to the Chinese as Ngao-mun, was established by the Portuguese in 1557, and long remained the centre of foreign trade with China, continuing to be the only outlet of commercial importance previous to the first China war and the establishment of the colony of Hong Kong

* *See* Admiralty Chart, No. 2,661A; scale, $m = 1{\cdot}17$ inches.

† Sub-Lieut. T. Dundas, R.N., states that the tides are very irregular, but that an average depth of 16 feet will be found at high water ordinary springs, between the road stead and the inner harbour.—Remark book, H.M.S. *Zephyr*, 1882.

‡ *See* Admiralty Plan of Macao, Chart No. 2,661.

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in 1842. Macao has never been recognised as a possession of Portugal by the Chinese government, which, as late as 1862, refused to ratify a treaty in which an article to that effect had been embodied; the British government, however, has recognised the jurisdiction of its law courts as supreme.

The Inner Harbour is formed between the peninsula and Patera island to the westward. Its entrance is narrow, but the depths are 20 feet at low water close to fort San Iago or Barra, which is built on the south-west point; and from thence the soundings are 19 and 16 feet along the western shore to the town.* Daily steam communication is maintained with Hong Kong, and there is an excellent landing pier in the inner harbour. Steamers also ply between Macao and Canton, making the voyage on alternate days.

FORT GUIA LIGHT.—A *revolving* white light has been established at fort Guia, at an elevation of 332 feet, and in clear weather should be seen 20 miles. Its revolution is complete in one minute.

Within a distance of 12 miles a faint light is visible. A *green* light is shown from a buoy on N.E. end of Macao Fort rock. A *red* light from buoy on S.W. edge of Haeshin rock.

The light tower is octagonal, 45 feet high from base to vane, and is painted white.

Pedra Arèca, *a rock* which uncovers at low water, lies S.E. 4 cables from the south point of Macao, and has depths of 9 to 12 feet all round.†

Lady Franklin Rock, with 13 feet water at low water spring tides, lies N.E. ½ N. one mile from Cabrita point (Typa island).

PILOTS, Port Regulations.—The port regulations now in force were issued in 1855. They require a report of the arrival of all vessels within 24 hours under a penalty of 100 dollars. Ships' papers must be lodged at the office of the captain of the port. A government school of pilotage is established for the instruction and examination of pilots, who are not allowed to serve unless duly qualified. The charge for bringing a vessel into the inner harbour is 7½ dollars. Canton river pilots are procured at Macao, and each receives a chop from the residing mandarin, to deliver to the officer stationed at the Boca Tigris, describing the force of the ship and to what nation she belongs.

CLIMATE.—The situation of Macao with full exposure to the S.W. monsoon, renders it a more agreeable and salubrious residence during the

* It is stated in the *Treaty Ports of China*, page 224, that the inner harbour in 1867, had become so shallow as only to accommodate vessels of light draught.

† It is intended to place on this rock an open ironwork lighthouse, exhibiting a red light visible 4 miles.—Navigating Officer, H.M.S. *Zephyr*, 1882.

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hot season than Hong Kong, for although the place is by no means exempt from the diseases prevalent in the adjacent colony, yet sanitary improvements have much increased the healthiness of the town.

Heat sets in about the middle of May, when the N.E. monsoon gives place to winds prevailing from S.E. and SW.* June, July, and August are distinguished by heavy rain-fall, the two latter being the hottest months of the year. With the latter half of September northerly winds again set in.

The mean temperatures derived from two sources, the observations extending over several years, are as follows:—Jan. 51° to 59°; Feb. 51° to 60°; March 64°; April 73°; May 77°; June 82°; July 85°; Aug. 84°; Sept. 82°; Oct. 75°; Nov. 64° to 70°; Dec. 57° to 63°. Maximum, 93°; minimum, 43°. The total rain-fall for the year ending April 30th 1864 was 90 inches.

Trade.—Macao being a free port accurate statistics are necessarily difficult to obtain, but from the report of the British Vice-Consul it would appear that the trade of the port for the year 1879 amounted to about 7,000,000 dollars. The shipping that entered during the year numbering 14 of a gross tonnage of 5,308 tons.†

MACAO ROAD is shoal, the depth being generally from 2¼ fathoms at low water springs on the west side, to 4½ or 5 fathoms close over to Samcock and the other islands that bound the east side. The bottom is soft loam or loose mud; there is, therefore, no danger of a vessel striking on her anchors, for they immediately bury in it.

Vessels of larger draught usually anchor in deep water near the islands, with Macao bearing between W. by N. and W.N.W., distant 6 or 7 miles, which renders the communication with that place difficult and dangerous in blowing weather. With Ko-ho point S. by W. ½ W., and Macao W.N.W., distant 4 or 5 miles, a large vessel may anchor in about 4 fathoms at low water, and be more conveniently situated for procuring a pilot.

Small vessels may anchor in the S.W. monsoon in the entrance of the Typa, off the Ko-ho shore, a little outside Ka-o islet, in about 3 fathoms at low water. In the N.E. monsoon they can anchor abreast a sandy beach, between the Cau-chau or Nine islands and Macao, in 3 or 3¼ fathoms; here they will generally have smooth water and an easy communication with the shore.

DIRECTIONS.—The route to Macao harbour for small vessels, through the Typa anchorage, has 7 feet at low tide in the fair track between

* In May 1875, a typhoon passed over Macao.—P. Aplin, Navigating Lieutenant H.M.S. *Modeste*, 1875.

† Report of Vice-Consul M Murray for the year 1879.

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the Typa and the harbour, and 8 to 12 feet between Typa island and Macao. A vessel should steer a direct course from the Typa to the harbour, and to avoid the sunken rock, Pedra-mea, lying about a quarter of a mile eastward of the north-east point to Macarira, keep the north-east point of Montanha open eastward of Macarira; or, in passing it keep rather towards the Typa island side of mid-channel.

From thence, steer direct for the entrance of the harbour, avoiding Pedra Aréca rock, from which the south point of the outermost of the two high Ma-lo-chau islets, to the south-west of the entrance, bears W. by S. ½ S. 1¼ miles, and the point of fort Barra N.W. about 4 cables. The north-east point of Montanha in line with east point of Macarira leads westward of the Pedra Aréca, and a vessel will not be too near it if she does not go eastward of a line drawn from the west point of Typa island to fort Barra point. This point should be rounded pretty close in entering, and the eastern shore kept aboard to the anchorage abreast the town, where a disabled ship may be hove down and repaired.

Entering from the outer roads, fort Barra point in line with the south extreme of Anang village, W. by N., will lead across the mud flats in 6 feet least water, deepening as the harbour is approached.

CAU-CHAU, or Nine islands, are a group of islets about 4 miles north-east of Macao. They lie close together, and, the depth is 3 fathoms at about half a mile eastward of the outermost islet, which bears N.E. by E. from Senhora de Penhos church at Macao; S.W. about three-quarters of a mile from this islet, is a rock always above water.

CUM-SING-MUN HARBOUR.*—From Macao the eastern shore of Macao island trends N.N.E. about 11 miles to Bluff head, where it turns abruptly westward and forms a deep bight called Cum-sing-mun harbour. This harbour is safe for small vessels, and would be a desirable haven for vessels of large draught to run for from the anchorage off Linton, at the approach of a typhoon, were it not for the extensive shoal flat they would have to cross, the depths being only 2 to 3 fathoms 2 miles outside the entrance; but they increase quickly to 7 and 8 fathoms when within half a mile of Bluff head, which is the proper side to steer for in coming from the south-east, and also to keep nearest to when running into the harbour.

The entrance, about half a mile wide, is between the south part of Kee-ow island and Bluff head. Between this head and the small islet and sunken rocks, near the island shore, the depths are irregular, from 14 to 6 fathoms; but inside, about half a mile West, or W. by S. from the small

* *See* Admiralty Plan of Cum-sing-mun harbour, No. 1,253; scale, $m = 3$ inches.

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islet, the bottom is soft, affording safe anchorage, in 6, 5, or 4 fathoms, taking care to avoid the shoal patches shown on the chart.

TIDES.—It is high water full and change in Cum-sing-mun harbour at 12h. 6m., and springs rise 6½ feet.

GREAT LADRONE, (Man-san of the Chinese,) being the outermost island directly fronting the estuary of Canton river, is generally used as a landfall by vessels bound there from the southward during the S.W. monsoon; and with the Little Ladrone adjoining to the westward, and Potoe to the north-westward, bounds the east side of the Great West channel, leading to the river.

This steep bold island may be easily known by its north-west part forming a round mount or dome, 1,468 feet high, which, being more elevated than the other parts, can be seen, in clear weather, about 27 miles from a vessel's deck, and 40 miles from the masthead; none of the other islands have a similar appearance, although most of them are high. The island, about 2 miles in diameter, has a rocky aspect close to the sea, but is safe to approach, the depths near it being 14 or 15 fathoms; at its south-west end is Pumice Stone bay, a small inlet, where fishing boats take shelter in the N.E. monsoon.

LITTLE LADRONE, (Pocking-han of the Chinese,) lying to the westward of, and not so much elevated as the Great Ladrone, is of a convex sloping form, and separated by a narrow channel of 9 to 18 fathoms water, but too confined for a vessel except in a case of necessity. Near the west side of the island the depth is about 10 fathoms, decreasing gradually to 7 fathoms, about half a mile southward of Potoe; there are 12 fathoms near its south point, and 14 and 15 fathoms near the south and south-east sides of the Great Ladrone.

A small rocky islet lies close to the north-east point of the Little Ladrone; and North nearly three-quarters of a mile from this islet is Black rock covered at high tide, with 10 fathoms close around: it will be prudent, therefore, in passing this locality at high water when the rock is covered, to keep about mid-channel between the Little Ladrone and Tong-ho island, which lies 2¾ miles to the northward. This is the only danger near the Little Ladrone, excepting a high rock close to its north-west side, having a depth near it of 9 and 10 fathoms.

POTOE, or Passage island, bearing N.N.W. ¼ W. 5½ miles from the south-west end of the Little Ladrone, is a sloping rock visible about 9 miles. There are 5 to 6 fathoms near it on all sides, but it ought not to be approached too close in light winds, as the eddies occasioned by the freshes out of the river may render a vessel unmanageable, and probably

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drift her towards it, or Wong-mou, the adjacent island. The channel between it and the south-east point of Montanha is about 5 miles wide, and safe.

WONG-MOU and LIUNGNIB ISLANDS.—Wong-mou, lying 1½ miles E.N.E. of Potoe, is 1¼ miles long, north and south, and has a peaked hill on its northern part; nearly half a mile from its west side are some rocks above water. Liungnib, lying a mile eastward of Wong-mou, has a round islet off its south end.

About three-quarters of a mile N.W. from the north end of Liungnib lie two rocks, which cover at springs, and break in blowing weather; therefore, in passing the north end of this island, keep at least 1½ miles from it.

TONG-HO ISLAND, about 2¾ miles N. by E. ½ E. from the Little Ladrone, is 1¾ miles long, east and west, and of moderate and unequal height. On its north-east side is a small cove into which the ship *Boddam*, drawing 21½ feet water, was taken by her pilot and remained in safety during a typhoon. The cove is 1⅓ cable wide, with 24 feet water at entrance, 17 and 18 feet well inside, at low water springs, and the bottom all soft mud. Here a vessel may lie at anchor, or if she has none, be run into the mud without risk. On either side the land is steep from the water's edge, terminating in a valley at the head of the cove, where there is a sandy beach and plaintain trees: it is the chief rendezvous of the fishing boats in bad weather. The rocks along the north-west side of the cove, one-third to half a cable off shore, have 12 feet, mud, within 3 or 4 yards of them.

Bouncer Rocks are two rocks close together, lying N.E. by N., two-thirds of a cable from the south-east entrance point of the cove; the outer rock is awash at low water.*

Supplies.—Good water may be obtained at Boddam cove, also beef, fish, poultry, and some fruit.

DIRECTIONS.—This cove will not be readily distinguished until the vessel is within about 2 miles of the north-east part of Tong-ho. Steering for the entrance, take care to give a berth to North rock lying 2 cables off the north-east point of the island, and to a rock, awash at low water, lying about 1½ cables north-eastward of Fort point; when the head of the cove bears S.W. by W., the vessel will be south-east of the rock.

Having brought the cove fairly open on the above bearing, steer for the point on the south-east side of entrance, being careful to keep the apex of

* *See* Admiralty Plan of Boddam cove, No. 1,023; scale, $m = 12{\cdot}0$ inches.

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Round hill at the head of the cove just open of two high-water points on the south-east shore, to avoid Bouncer rocks, and pass it the distance of half a cable; for the north-west point, where stands a ruined fort, and the point next westward, are bordered by rocks. Three cables south-east of entrance there is also a reef of rocks, extending three-quarters of a cable from the south-east part of the island; these are mostly all in sight at high water, and easily avoided in rounding by giving a wide berth. The flood sets N.W. outside the entrance, and the ebb S.E. They both run pretty strong, but there is scarcely a drain in the cove.

PAK-LEAK ISLAND, called also Putoy, lies N.E. by N. nearly 1½ miles from the Great Ladrone, and on its north-east part is a remarkable cone hill, 855 feet high, visible from Macao. The island is of irregular shape, and the hills on its southern side are much covered by black rocks. On its eastern side and fronting Hoa-ock islet is a cove where fishing boats find shelter; on its northern side are some small bays in which fresh water may be procured; and near its north-east point is House islet, formed of rock, on which the fishermen have a hut and fishing stage. A rock, awash, lies close off its south extreme.

Clio Rock, on which H.M.S. *Clio* struck, 12th December 1841, lies about 2 cables from the west side of Pak-leak, with the north-west extreme of the island bearing N. by W. distant 4 cables.

CHUK-WAN ISLANDS.—These two islands lie about E. by N. 1½ miles from Pak-leak, and the larger island, the eastern one, has Sharp islet, a high rocky islet, lying off its south-east point, and a small bay on its north side. There are 14 fathoms between Hoa-ock and the western island, and 11 and 12 fathoms northward of the group.

Raleigh Rock, on which H.M.S. *Raleigh* struck, 14th April 1857, is a small pinnacle, which breaks, when there is a moderate sea, at low water springs, with 9 or 10 fathoms close to. Its position is nearly in mid-channel between Pak-leak and South White rock, distant 2½ miles from the latter. When on the rock the gap in the centre of South White Rock is in line with the right extreme of a small wedge-shaped island off the eastern side of Lafsami island, bearing N.E. by N.; the highest part of Ai-chau island E. ⅓ N.; and the peak of the great Ladrone, seen over the western slope of Pak-leak, S.S.W. ½ W.

NORTH and SOUTH WHITE ROCKS are two high white rocks half a mile apart, lying North 3½ miles from the western or small Chuk-wan island. From the southern rock the north-east point of the eastern Chuk-wan bears S.S.E. ¼ E., distant 4½ miles; the peak or

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highest part of Ty-lo W. by N. ½ N., 5¾ miles; the north point of Luingnib W. by S. ⅛ S., 6 miles; the southern part of eastern Chi-chau N.E. by E. ⅜ E., 5¼ miles; and the western Ai-chau island S.E. by E. ½ E., distant 6 miles. About a mile south-east of the southern rock, is a small black rock, visible only at low springs, having 9 fathoms water close around. Between the White rocks, but a little more westerly, is a smaller rock above water.

CAUTION.—The White rocks may be seen in fine weather in time to avoid them, and the depth is about 9 fathoms near their eastern side, 8 fathoms on the western and northern sides, and 9 fathoms in the channel, between them and Chuk-wan; but since the loss of the *Raleigh* by striking on the Raleigh rock, it will be prudent not to use this channel until it has been more accurately examined.

AI-CHAU ISLANDS lie N.E. by E. ½ E., 4½ miles from the eastern Chuk-wan, and the eastern or larger island is separated from the smaller one, on its west side, by a very narrow channel with 4 and 5 fathoms in it at low water. The depth on their southern side is 14 fathoms, on the north and east sides 12 and 13 fathoms, and on the west side 8 or 9 fathoms.

HILL ISLET, lying N.E. 1½ miles from the northern part of the eastern Ai-chau, has 11 and 12 fathoms water at a short distance from the rocks around it.

The SAMOUN, or Three gates, form a group of three small islands, 2½ miles eastward of Ai-chau, extending about 3¼ miles in a N.W. and S.E. direction, with narrow passages between them. Near the north-west part of Hak-chau, the north-west island, are two peaked islets; and on the northern side of the group, between the eastern and middle islands, is Gauze, another high rocky islet, with a bed of rocks lying southward of it; the south end of the eastern island is the highest part of the group, and forms a round mount. A small harbour on the south-west side of the largest or middle island affords shelter to two or three vessels during a N.E. gale, with anchorage in 6 to 10 fathoms, muddy bottom.

LINGTING ISLAND, bearing W. ¾ N. distant 15 miles from the N.E. head of the Lema islands, is of rugged appearance, about 1¾ miles long, east and west, and rises to a peak near its centre. Two rocks, one awash and the other above water, bearing N. by E. and S. by W. of each other, lie eastward of the north point of the island; the outer one, awash, is distant nearly a mile E.N.E. from the north point, and the other S. by W. about half a mile from the outer one, with depths near them of 13 fathoms, but foul ground between.

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Needle Rocks, on which H.M.S. *Doris* struck in 1813, are two heads lying within a few yards of each other, about 1½ cables south-west of the low rocky north-west extreme of Lingting, and they are so sharp that it is difficult to keep the lead fixed on their points; at low springs they have about 6 feet water on them, at which time, with a swell, they may probably show either breakers or a rippling. From the outer rock the south-west extreme of the Lema islands is just set in with the south-west point of Lingting, and the highest part of Lamma island is a little way over the low north-west point. A vessel will avoid them when passing round the north-west end of Lingting by not approaching it within half a mile, or by keeping the south-west extreme of the Lema islands a little open south-west of Lingting.

The depths close to the north point of Lingting are 18 or 19 fathoms, decreasing to 14 and 15 about a mile distant; to the southward and westward of the island, there are 10, 11, and 12 fathoms over soft bottom.

CAUTION.—When passing northward of Lingting at night, give its north side a berth of 1½ miles to avoid the two rocks off its north-east side.

TY-LO ISLAND is the southern of the range of small islands bounding the east side of Macao road. It is high near the western part, sloping a little to the eastward, and lies N. ½ E. from the north end of Liungnib, from which it is separated by a good channel 2¾ miles wide, but in using it take care to avoid the rocks off the northern point of the latter. Ty-lock, about half a mile northward of Ty-lo, is a small rocky islet, with a large rock on its summit.

SAM-COCK ISLAND, the largest of the above range, and lying 1¼ miles N.N.E. from Ty-lock, is of moderate height, rugged in appearance, and in the form of a pyramid. Between it and Ty-lock is the small islet Sy-lock, and two rocks above water; but the channels between these are so narrow, that they should not be attempted on account of the strong eddies, which frequently render vessels unmanageable. In passing between Sam-cock and Chung-chau-si, the next island to the northward, keep in mid-channel or nearest to the latter, in 6 or 7 fathoms, as there are only 3¼ fathoms at a quarter of a mile from the north point of Sam-cock, 3¼ fathoms about a quarter of a mile off the west point, and 3 fathoms the same distance off its eastern point.

Water.—On the northern part of Sam-cock there is a small bay or cove for boats, and the island affords fresh water.

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CHUNG-CHAU-SI, or West Water island, the northernmost of this range, lies N.N.E. about $1\frac{1}{4}$ miles from Sam-cock, with 7 fathoms near it to the eastward, and 5 and 6 fathoms to the northward and westward. The depths are 5 or $5\frac{1}{2}$ fathoms about half a mile off the western side of this range, from Ty-lo to Chung-chau-si, and 7 fathoms off the eastern side; the ebb stream runs strong from the northward along the western side, and the flood in eddies from the south-eastward.

FOUR-FEET ROCK.—This small dangerous needle rock, with only four feet on it and 10 fathoms close around, lies E.S.E. 3 miles from Chung-chau-si, and from it the summit of Ty-lo bears S.W. by W., the centre of Sam-cock W. $\frac{1}{2}$ S., and the small islet lying off the north-west end of Chung-chau N.N.E. $\frac{1}{4}$ E. When Chuck-tu-aan island (3 miles S.E. by S. from Chung-chau-si) and the small islet off the north-west end of Chung-chau are on the same bearing, about N.N.E. $\frac{1}{2}$ E. and S.S.W. $\frac{1}{2}$ W., the rock will be between the two, but nearest the former; therefore if a vessel has occasion to enter Macao road by this channel, and keeps about three-quarters of a mile off Lafsami and the south side of Chung-chau, she will pass in mid-channel, and have 10 or 12 fathoms water decreasing to 7 fathoms as she nears Chung-chau-si.

CHUNG-CHAU, or Water island, which with the islands southward of it bound the south-west side of Lantao channel, lies about S.W. by W. $2\frac{1}{2}$ miles from the south-west point of Lantao, is high, with a peaked hill near its north point. It is $1\frac{1}{2}$ miles long, N.W. and S.E., and there are no hidden dangers near its northern side. The soundings in the channel between it and the south point of Lantao are irregular, and strong eddies generally prevail, the depths being 7 fathoms near the point of Lantao, 18 or 20 fathoms in mid-channel, and 28 or 30 fathoms close to Chung-chau. There is a cove for boats on the north side of the island, and a short distance westward of its northern point is a round and high islet with a large rock on its summit; near the north and west sides of this islet the depth is 15 fathoms.*

Chung rock, which dries at low water, and on which the British vessel *Minard Castle* struck in 1883, lies with the following bearings and distances:—

South-east point of Chung-chau - S. $60\frac{1}{2}^{\circ}$ W., distant $6\frac{3}{10}$ths cables.
East point of Chung-chau - West, „ $3\frac{1}{10}$th „

A sunken rock, 10 feet in extent, with 6 feet on it at low water, lies 75 feet S. $39\frac{1}{4}^{\circ}$ E. from Chung rock; and another sunken rock is situated about 200 feet south-westward of Chung rock.

* "There is a rock about the centre of the channel, west of the north extreme of Chung-chau, which shows a little by ripples over it."—Navigating Officer, H.M.S. *Egeria*, 1875.

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NOTE.—The wreck of the *Minard Castle* lies in 7 fathoms with the following bearings and distances :—

Chung rock - - -	N. 1° E.,	distant 3 cables.
South-east point of Chung-chau	West.	„ $5\frac{4}{10}$ „
East point of Chung-chau -	N. 47° W.,	„ $4\frac{2}{10}$ „

NAU-TAU-MUN, or Bullock-head Gate, the next island to the south-east, is small but high, and separated from Chung-chau by a narrow channel, through which H.M.S. *Doris* ran, and found shoal water near Chung-chau. The depths near the north side of Nau-tau-mun are 15, 16, and 17, fathoms, rather irregular ; but to the southward, in the bay which it forms with Lafsami, there are only 3 to 5 fathoms.

LAFSAMI ISLAND, separated from Nau-tau-mun by a narrow channel, is larger than either Chung-chau or Nau-tau-mun. It is inhabited on the south-western side, where fresh water is to be had in a small bay. The depths on its north side in Lantao channel are very irregular, from 17 to 25 fathoms in overfalls, about a quarter of a mile off, and on its south side 10 and 11 fathoms. This island from some views forms a peak; and a short distance eastward of its south point is a rocky islet, on which the fishermen have huts, and a winch for heaving up their nets.

CHI-CHAU ISLANDS.—Chi-chau, the largest of two islands lying $2\frac{1}{4}$ miles E.S.E. of Lafsami, forms the south side of the east entrance of Lantao channel. The island is high, of round appearance, inhabited on the west side, and separated by a narrow channel from the smaller and lower island, on its western side; a sunken rock lies off its north east point, and a patch of 4 fathoms about a quarter of a mile off its north point. Between the west point of the smaller island and the rocky islet lying off the eastern side of Lafsami is a safe channel $1\frac{1}{2}$ miles wide, of 9 and 10 fathoms, which may be taken by a vessel bound up the river when she enters the islands from the south-east between Chuk-wan and Ai-chau.

SOKO ISLANDS.—A-chau, the southern of the two Soko islands, is distant nearly 4 miles S.E. $\frac{3}{4}$ E. from the south point of Lantao, and forms the north side of the eastern entrance of Lantao channel. The south point of A-chau is high, and rises very steep, having a depth of 7 fathoms close to; the soundings between it and Chi-chau are 11 or 12 fathoms in mid-channel, 13 fathoms nearly over to Chi-chau, deepening suddenly to 25 or 30 fathoms in a hole or swatch close to Chi-chau.

The other island, lying a short distance northward of A-chau, is about a mile long, east and west, and very narrow in the middle. A

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sand spit extends nearly West upwards of 1½ miles from its west side, and on the west extreme of the spit are 2¾ fathoms at low water, decreasing quickly to 2 and 1¼ fathoms towards the island.

A rocky islet and two rocks above water lie between the two Soko islands, nearest to the south-west point of the northern one; there is also three-quarters of a mile south-eastward of A-chau, a high rocky islet which may be passed at half a mile to the southward in 7 fathoms, but the ground is foul between it and A-chau.

Water.—Fresh water may be procured at a little sandy beach on the northern side of A-chau.

The south coast of Lantao island is described on page 96, and the neighbouring islands, Ai-chau, Lingting, and the Samoun group at page 77.

SOUTHERN APPROACHES TO HONG KONG.

KYPONG ISLANDS are the southernmost group of the archipelago fronting the estuary of Canton river, extending N.E. and S.W. about 10 miles

Ass's Ears.—Pak-tsim, the largest and north-eastern island, E. by S. 16 miles from the Great Ladrone, has near its western extreme, the Ass's Ears, two high remarkable peaks, which make it easily known, as they rise from the same base almost perpendicularly from the sea to the height of 980 feet, and sloping suddenly down on the north-east side, are united to moderately elevated land, which terminates that part of the island.

Tsi-mi-wan, the next island to the south-west, is of considerable size and separated from the south-west point of Pak-tsim by a channel about half a mile wide.

Gap, Peaked, and Rugged Rocks.—A range of islets extends 4½ miles in a south-westerly direction from Tsi-mi-wan; the south-westernmost islet, 60 feet high, called Gap rock, but Man-mi-chau by the Chinese, has a small gap in it. Between the south end of Tsi-mi-wan and Peaked rock, 180 feet high, the easternmost islet of the range, is a passage 1¼ miles wide, with 18 fathoms least water in it. Rugged rock, 50 feet high, lies about 1½ miles N.W. ½ W. from the south end of Tsi-mi-wan. The passage, about half a mile wide, between Nut island and the islet nearest to it to the southward, has 10 to 26 fathoms water. There is also, between Gap rock and the other islets to the eastward, an opening a mile wide, with 16 to 18 fathoms water, and safe to pass through with a steady wind.

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Kwei-tau, or tortoise head, a white rocky islet, lies about three-quarters of a mile from the east point of Pak-tsim, having other rocks between it and the point, neither of which ought to be approached.

Gay-une is another islet, rather more than a mile northward of the north end of Pak-tsim: the passage between it and the latter, however, ought not to be attempted unless from necessity; for there is said to exist some straggling rocks on which the sea breaks at times.

CAMBRIDGE ROCK, on which a vessel of this name struck, August 30, 1820, requires the greatest care to avoid when passing through the Tai-ta-mi channel between the westernmost of the Lema islands and the above rocks. The rock is of a spiral form with only 17 feet water on it, and sometimes breaks. It lies N. by W. $\frac{1}{4}$ W. $2\frac{1}{4}$ miles from Kwei-tau, N.N.E. $\frac{1}{2}$ E. $1\frac{3}{4}$ miles from the north point of Pak-tsim, and from it the highest part of Chi-chau island is in line with Hill islet N.W., and the south-east side of Gay-une isle is on with north-west extreme of Rugged rock, S.W. $\frac{1}{2}$ W. There are 4 and 5 fathoms on the rocks which surround the spiral rock; and thence the depths increase to 23 fathoms in Tai-ta-mi channel, which is $2\frac{3}{4}$ miles wide, and safe by borrowing towards the Lema islands when passing through, taking care to give a wide berth to "Mosquito Rock."*

LEMA ISLANDS consist of three large and one small island, extending in an E.N.E. and W.S.W. direction $12\frac{1}{2}$ miles.

Tamkan, the easternmost and largest island, is 6 miles long and a mile broad, of moderate height and undulating, and separated from Ye-chau, the middle island, by the narrow Yat-moun channel.

The Yat-moun channel by Capt. Bate's survey of 1850, is free of danger and carries a depth of 12 to 19 fathoms, but by the following extract† from the log of the ship *Cordelia*, it would appear there is a sunken rock in mid-channel and that this passage should not be attempted unless from necessity:—

"November 14th, 1834: the current and swell setting the *Cordelia* bodily on the land, and having the Yat-moun channel open, steered for it, keeping near the south-west end of Tam-kan to prevent the vessel from being carried by the current on a small rocky islet lying off the north-east point of Ye-chau; afterwards endeavoured to steer in mid-channel, but the eddy current swept the vessel into the surf that rebounded from the point of Tam-kan, when at the same time a sunken rock appeared about mid-channel, upon which the vessel must have been lost by following the track

* *See* page 83.

† Horsburgh's Directory, Vol. II., seventh edition, page 398.

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intended. Although blowing strong outside, the sails flapped to the mast as the vessel entered the channel, which ought not to be adopted unless in a case of extreme necessity, and then the shore of Tam-kan should be kept close aboard to avoid the rock."

Ye-chau is the middle and highest of the Lema islands, and, when viewed from most positions, appears flat on the top. Close to its north-east part is Round island, a small rocky islet, visible when the Yat-moun channel is open.

Poun-tin, the third or southern of the large islands, is separated from Ye-chau by the narrow Ye-chau channel, with 19 to 30 fathoms water in it. This island, 1,210 feet high, forms more in a peak than either of the other two, and has a point projecting westward with a hummock on it, named E-chau head.

Tai-ta-mi, a small but high islet, lies to the southward of this head, with a narrow channel between it and Poun-tin, and forms the north-east boundary of the Tai-ta-mi channel, which has Cambridge rock, Pak-tsim island, and the Kwei-tau rocks bounding its south-west side.

Mosquito rock.—This sunken danger, lying about 3½ cables southward of Tai-ta-mi islet, is 50 feet long east and west by 30 feet wide, and has 13 feet over it at low water spring tides. From the rock the south-east extreme of Tai-ta mi islet bears N. 58° E.; and the south-west extreme N. 30° W. By keeping the south-east extremities of Tamkan and Yechan islands in a line on a N.E. by E. bearing, and Echau head (Pouti island) well open of the western extremity of Tai-ta-mi islet, this danger will be avoided.*

DIRECTIONS.—The Lema islands on their southern side are all steep and rocky, not affording even a single bay for a boat to shelter in, and the soundings are 22 or 23 fathoms about 1½ miles from their coasts; on their northern sides the depths are generally 15 or 16 fathoms close to the shore. Vessels in the N.E. monsoon should endeavour to pass between the north end of Tam-kan and Putoy, which lies 6 miles northward, and its north end, when viewed from the E.N.E., forms a small peaked hummock.

Notwithstanding the Lema islands appear barren, there are a few men residing on them, preparing charcoal from small quantities of brushwood found between the rocks, which they send to Macao for sale. Fresh water may be obtained along the north shore of Tam-kan at several places; and close to the westward of its north east point, in a little cove, called Joss House bay, is a Chinese place of worship, and about this part the Compradores' boats await vessels after the end of August, when the

* Remark Book of H.M.S. *Mosquito*, 1879.

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easterly winds set in. The Yat-moun and Ye-chau channels should not be used unless in a case of emergency, or when the wind blows directly through, as they are narrow, with deep water, and have generally a strong current sweeping through them. Yat-moun is the widest, and of moderate depth, but if the *Cordelia* rock be in existence, it is very dangerous.

LAMMA ISLAND lies off the south-west side of Hong Kong, and its south-west point bears N.W. by W. $\frac{1}{3}$ W. 13 miles from the N.E. head of the Lema islands, and N.E. $5\frac{1}{2}$ miles from the north point of Lingting. The island, of rocky appearance, is about 4 miles long, north and south, and 2 miles wide, but narrowed near the middle by a deep cove (Picnic Bay) on its east side, and a long bay on its west side, so that between them the island is not more than a quarter of a mile across. The north end of the island is about a mile distant from the south west part of Hong Kong.*

The south-east point of the island is remarkable from its being a small round hummock, of bright green appearance on the top, and rocky near the water's edge; this part of the island, as far as the eastern point, is rocky close to the shore, with 13 or 14 fathoms half a mile off.

The cove on the east side of the island, to the northward of its eastern point (Picnic Bay) is about $1\frac{1}{4}$ miles deep and two-thirds of a mile wide. It carries a depth of 8 to $3\frac{1}{2}$ fathoms, but a cluster of rocks extend half way across its head at $1\frac{1}{2}$ cables from the shore. A vessel may anchor in 6 or 7 fathoms over rocky bottom, about half a mile within the entrance, and ride in security, being land-locked. George island, 234 feet high, lies close to the northward of the north point of the cove.

Rock.—A rock awash at low water lies N. by W. $\frac{1}{4}$ W., about one cable from the rock which is above water near the north-west point of Lamma island. The channel between them is unsafe. Close outside the danger there is 6 fathoms, decreasing to $5\frac{1}{2}$ fathoms, at 4 cables west, and $5\frac{1}{4}$ fathoms about 6 cables north of it.

The south-west point of Lamma island open of the west point, bearing S. by E. $\frac{1}{2}$ E., leads to the westward of the danger, and Tree island open of the north point of Lamma island, bearing E. $\frac{3}{4}$ N., leads to the northward.

LAMMA CHANNEL.—East Lamma channel, between Lamma island and Hong Kong, is about a mile wide, and has general depths in it of from 17 to 23 fathoms; but a vessel will find a good and sheltered anchorage between George island and the north point of Lamma in 7 or 8 fathoms. There appear to be no dangers in this channel, but a rock† is

* *See* Admiralty Chart of Hong Kong, No. 1,466; scale, $m = 2{\cdot}4$ inches.

† This rock is doubtful; it is not shown in Capt. Belcher's survey of 1841.

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said to lie off the south-east point of Mas-kong or Round island, on the Hong Kong shore.

West Lamma channel, between the western side of Lamma and the islands lying off the east side of Lantao, has general depths of 5 and 6 fathoms on a mud bottom. Entering it from the East Lamma channel, the soundings will decrease rapidly to 7 and 6 fathoms after rounding the north point of Lamma, off which, at a third of a mile to the N.N.E., is a rocky patch of 8 fathoms, surrounded by depths of 14 to 21 fathoms.

Water.—About a mile north-east of the north point of Lamma island, and near the western point of a deep cove, named Aberdeen or Shekpywan harbour, on the Hong Kong shore, there is a cascade where good water can be conveniently obtained.

CHUNG ISLAND is near the south-east side of Lantao, N. ½ W. 5 miles from Lingting. Its north and south parts are high, but it is narrowed near the middle, which is low, by two bays, one on the east, the other on the west side of the island. A vessel of moderate draught will find good shelter, during an easterly gale, in the western bay in 3¼ fathoms. There is no danger in passing the south end of the island, the depths being 7 and 8 fathoms close to, and 5 and 6 fathoms near the south-western part; but East, about 3 cables from the eastern point of the island, is a small rock, which dries at low water, and has 6 and 7 fathoms close to.

To the northward of Chung, and at a short distance from Lantao, are several small islands and rocks above water, but the channels between them and the Lantao shore are narrow, shoal, and unfit for large vessels.

LIGHT.—A fixed red light is exhibited from an iron beacon situated on the rock lying between Lantao and Chung islands.*

Water.—Fresh water can be procured in the bay on the western side of Chung.

The PU-TOY GROUP, lying south-east of Hong Kong, bounds the northern side of the Lema channel.†

Pu-toy, the southern island of the group, bears N.N.W. ½ W. 6 miles from the N.E. head of the Lema islands. It is of moderate height, and of barren appearance, there being only a small quantity of brush-wood in the valleys. On its western side is a cove for boats and a small rocky islet.

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* Remark Book of Sub-Lieut. J. F. Stuart, H.M.S. *Sheldrake*, 1879. *See* also page 94.

† Com. C. M. Buckle, R.N., who cruised for some days about the islands southward of Hong Kong in H.M.S. *Cormorant*, 1865, remarks that there are a number of small rocks amongst them, some above and some below low-water mark, which, owing to the smallness of the scale of the chart, do not appear.

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Le-chau or Beaufort Island, lying northward of Pu-toy, and separated from it by a narrow channel, is 895 feet high, flattened at the top, and steep all round; its north-western brow has a small peak, with a few large and remarkable rocks on it. Half a mile off its south-west point is Castle rock above water, having no hidden dangers near it.

Sun-kong, about 1½ miles East of Lo-chau, is a small island rising in a peak 466 feet high towards the centre. Near its north-western part are two rocks considerably above water, the southern one having shoal water off its extremes.

Wag-lan, about three-quarters of a mile East of Sun-kong, is a small barren rocky islet, the easternmost of this group, having 16 and 17 fathoms water at a short distance to the eastward.*

HONG KONG ISLAND† about 9 miles long, N.W. by W. and S.E. by E, 2 to 5½ miles broad, and with an area of about 29 square miles, lies between Lamma island and the main, and separated from the latter by a narrow channel a quarter of a mile wide, named Lyemun pass. The appearance of the island is somewhat picturesque, but on the whole generally barren and unprepossessing. It consists for the most part of rocky ranges, on the highest summit of which, Victoria peak, 1,825 feet above the sea level, at the north-west part of the island, is a signal station which communicates with the city of Victoria and vessels seaward.‡ A good military road about 22 statute miles in length encircles the island. The city, the Cathedral Tower of which is placed by Lieut.-Com. F. M. Green, U.S.N., in longitude 114° 9′ 31·5″ E., and latitude 22° 16′ 52·49″ N.,§ is 3 miles in extent, and situated on the north side of the island, nearly abreast Kowloon point, the extreme of the peninsula of the mainland which forms the west side of Kowloon bay. Water abounds everywhere, and is supplied to shipping by tanks; each valley of the least pretension sends its stream to the cultivated grounds near the shore, where a portion is retained for irrigation, and the remainder is permitted to find its way to the sea.

The shores of Hong Kong are indented by numerous bays, of which the most considerable are on its south side. There is good anchorage throughout the entire channel between the island and the main, except in

* Light proposed.

† *See* Admiralty Chart of Hong Kong, No. 1,466; scale, $m = 2{\cdot}4$ inches.

‡ For these signals, *see* Appendix, page 691.

§ Telegraphic determinations of longitude in Japan, China, and the East Indies (by Lieutenant-Commander F. M. Green, U.S.N., and assistants). Bureau of Navigation, Navy Department, Washington. This position differs 6·5 seconds of arc from that of the late Sir Edward Belcher, which had hitherto been adopted by the British Hydrographic Office. All Lieutenant-Commander Green's observations depend on the Government Observatory at Madras, being in longitude 80° 14′ 51″ E.

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the Lyemun Pass, where the water is deep; but the best anchorage is in Hong Kong road, in front of the settlement, where the depth is from 5 to 9 fathoms over good holding ground.* During the typhoon months the anchorage in the northern part of the road is considered preferable in consequence of the shelter afforded by Kowloon peninsula to the north-east, the point from which the wind blows hardest. The inner anchorage in Victoria bay† is in 6 and 7 fathoms, about half a mile off shore, abreast the Ordnance jetty, where a vessel will be sheltered from the eastward by Kellett island and East point, and be out of the strength of the tide.

The population of Hong Kong in 1881 amounted to 160,402 ;‡ of which 152,412 were coloured, and 7,990 white. The total number of vessels entered at the ports of the island was, 27,553, amounting to 4,533,304 tons.

Hong Kong being a free port it is impossible to give any correct statistics of its trade, but its enormous extent may be approximately estimated from the fact that the amount of foreign and British tonnage, entering and leaving the port annually averages over two millions of tons.

It is the centre of trade in many kinds of goods. Amongst the principal are opium, sugar and flour (produced in Tungkoon); salt, earthenware, oil, amber, cotton, and cotton goods, sandal-wood, ivory, betel, vegetables, live stock, granite, &c., &c.§

Hong Kong was first occupied by the British in January 1841, having been ceded by the Chinese Commissioner. On the 6th February 1842, it was declared a free port by Sir H. Pottinger, and on the 26th January 1843, a formal ratification of the treaty between Great Britain and China took place, followed by a proclamation announcing the fact, and directing that the city be called Victoria, in obedience to Her Majesty's commands. It was constituted a British crown colony by Order in Council of the 5th April 1873. The peninsula of Kowloon, opposite the city, was subsequently ceded to Great Britain by the treaty of Tientsin in 1860.

Climate, &c.—Hong Kong lies just within the tropic, and is subject to an excessively hot and a somewhat cool season, coinciding with the S.W. and N.E. monsoons; it has also a dry and a rainy season. The annual range of temperature is from 45° to 99°, and the average annual range from 74° to 93°. July and August are the hottest months, the temperature ranging from 80° to 94°, with a difference of 10° between day

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* The *Ocean* left Hong Kong at low water on 22nd Nov. 1871, and carried one fathom less water than the chart showed from the (Man of War?) anchorage to the "Lymum Pass." Navigating Lieutenant S. Cole, H.M.S. *Ocean* 1871.

† *See* Admiralty plan, No, 1459.

‡ Inclusive of naval, military and shipping.

§ Colonial Office list, 1883.

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and night. The city being situate on the north side of the island under the peak, is completely sheltered from the influence of the S.W. monsoon, which, on the southern side of the island agreeably tempers the violent heat. November to January* is the coolest period, and the air is often bracing; the temperature occasionally falls below 40°, and ice has been known on the peak, but this is rare; sudden changes frequently take place, a day of almost tropical heat being followed by a cutting northerly wind, for when calms and variables prevail, it is hot even in winter, and it requires the north-east wind and overcast sky to reduce the temperature, gales from the latter quarter are common in the autumn and spring months, blowing for two or three days. March and April are rainy and foggy, and the damp is so penetrating that the greatest care is required to prevent clothes, books, instruments, stores, &c., from being destroyed or injured by mildew. Typhoons seldom occur before June or July, for they advance northward as the season progresses, and may be expected most severe at Hong Kong about the autumnal equinox.†

The wet season commences in May and continues until the beginning of August, and during this period the rain falls almost without intermission, frequently causing floods which do great damage.

The minimum annual rain fall from 1865 to 1881 was 56 inches, and the maximum 99 inches, the annual average being 78·54 inches.

Although visited by sickness caused by malaria, it has been shown by statistics that for salubrity Hong Kong may compare favourably with most of the ports of the East, and its healthiness has been greatly increased of late years by its sanitary arrangements and excellent water supply. The annual rate of mortality amongst the foreign residents between 1858 and 1865, was about 5½ per cent., ranging in various years between 2 and 8 per cent. The most unhealthy years have been those most deficient in rainfall. Dysentery and intermittent fever are not uncommon, and the bilious remittent fever, sometimes so nearly allied to yellow fever, occurs in the summer season, small-pox prevailing in January, February, and March. Neglect of the usual conditions of health, such as exercise, diet, proper clothing, and the like, conduce to, and exposure to the rays of the sun, even in winter, almost invariably results in, sickness.

The Harbour consists of the space enclosed between the northern shore of the island and the mainland immediately opposite. It is only exposed to the force of strong westerly gales, and their effect is mitigated by the large number of outlying islands, so that altogether it may be deemed one of the safest in the world. Eastward of the harbour, the peninsula of Kowloon forms an inner harbour which is nearly landlocked, and which affords protection to vessels in all weathers, but the situation is not a

* For the seven years, 1868-75, the average temperature was 60°·8; range 58° to 63°·4.

† For remarks on typhoons at Hong Kong, *see* Appendix, page 692.

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convenient one. On the approach of a typhoon the native craft almost invariably seek shelter over towards the northern side of the harbour.* The anchorage is most commodious, and is entered from the sea by fine deep-water channels both from the eastward and westward. The depth of water varies from 3 to 8 fathoms, deepening to 11 fathoms off Kowloon point.† ‡

There are port regulations for the berthing of vessels under the superintendence of the harbour master. The anchorage for the merchant shipping is abreast the centre and lower parts of the city, on either side a fairway channel, marked by buoys; that for the men-of-war lies eastward, between the Government establishments and Kowloon, the cathedral roughly indicating the dividing limit.

Time Signal.—A red ball, 3 feet in diameter, hoisted at the main truck of the stationary guard ship The signal is made daily as follows: Ball hoisted half way up as preparatory at 12h. 55 m. p.m., close up at 12h. 57m., and dropped at 1h. 0m. p.m. Hong Kong mean time—equivalent to 17h. 23m. 20s. Greenwich mean time. When signal fails in accuracy, ball remains half way up till 1h. 5m., it is then again hoisted close up, and dropped at 1h. 10m. p.m.

Supplies.—Stores and provisions of every kind can be obtained in abundance, and there is a well-regulated market. Excellent water from the well-constructed water-works is efficiently supplied to the city and shipping. Every appliance necessary for refit and for the repairs of ships and steam machinery will be found at the dock establishments, stores, &c.; and there is a good hospital for seamen, a well-conducted sailors' home, and a seamans' club for man-of-war's men.

DOCKS, Repairs, &c.—There are two large granite docks at Aberdeen or Shekpywan harbour, a narrow inlet formed between the south-

* "Japan Rock" is about 100 yards west of a rock which has a buoy on it, and is one of a cluster of rocks lying off what was formerly "Point Albert," and two buoys (marked "rocks") have been for a long time placed on this cluster. Harbour Master, Hong Kong, March, 1876.

† *See* plan of Man of War anchorage, 1877, No. 1459.

‡ Lieut. Hoskyn of H.M.S. *Flying Fish* remarks, 1883, "that the coarse sand and other "detritus matter accumulating at the mouth of the Nullahs is causing a shoaling of "the water along the foreshore of Hong Kong harbour; this shoaling does not at "present extend to any great distance beyond the 3 fathoms contour line, the "the depth of water being practically the same as shown on the chart. These observa- "tions have reference chiefly to the portion of the harbour surveyed by the officers of "the *Sylvia* in 1877; consequently, the changes are due to the short period of six "years. As regards Causeway bay, across which a breakwater has recently been con- "structed, a very considerable change is apparent, in this case due to a period of 40 "years, as the chart of the part has not been corrected since 1841."

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west shore of Hong Kong, and small island off it named Aberdeen or Taplichau. They lie on the Hong Kong shore of the harbour.* There are also two docks at Kowloon, and two patent slips, one at Belcher Bay and the other at East Point.

Aberdeen Docks.—The dimensions of these docks (belonging to the Hong Kong and Whampoa Dock Company), are as follows:

	Lament Dock. Dock 1.	Hope Dock. Dock 2.
Length over all - - -	340 ft.	433 ft.
Breadth of entrance - - -	64 „	84 „
Depth over sill, ordinary springs -	16 „	24½ „†
Rise of tide—springs - - -	} *See* Tides.	
Rise of tide—neaps - - -		

The level is much influenced by the wind at all times, and from October to January inclusive, the average height is about 1½ feet greater at springs than during the remainder of the year.

A steam tug of 100 horse power nominal, is always in readiness to tow sailing vessels round from Hong Kong free of charge, and will take them back or to sea at reduced rates.

The workshops on the premises possess every appliance necessary for the repairs of ships and steam machinery; the engineers and blacksmiths' shops are provided with steam lathes, planing, cutting, and punching machines, and other plant, capable of executing work on the largest scale; and the work is entirely carried on under the supervision of experienced Europeans. There are also powerful lifting shears on the jetty, alongside which vessels can lie in 24 feet water, and take in or out boilers, masts, &c. New boilers can be made, iron and brass castings executed, and stores, such as paint, copper, canvas, and the like, supplied.

Kowloon Docks. — (Hongham bay).—Also belonging to the Hong Kong and Whampoa Dock Company, are, from their position of immense advantage to vessels requiring instant docking on reaching the port. Their dimensions are as follows:—

	Dock 1.	Dock 2.
Length over all - - -	340 ft.	245 ft.
Breadth of entrance - - -	74 „	49 „
Depth over sill - - - -	18 „	14 „
Rise of tide { Springs - - -	7 to 8 „	7 to 8 „
Rise of tide { Neaps - - -	2½ „	2½ „

* A rock breaks at low water about 50 yards to the westward of the north point of Aberdeen bay. There is also another rock a little more than half that distance off a point to the south of it, on which a vessel was lost, also a third 300 yards S. ½ W. of the South entrance to the bay called "West reef."

† The sill and floor are level. This depth is seldom obtained on sill.

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Cosmopolitan Docks* are situated on the west side of Kowloon peninsula; off the entrance (which lies east and west) are moored two red buoys; one in 26 feet, and the other in 20 feet water, for the convenience of vessels docking.

The dimensions of these docks are as follows :—

Total length of docks	460 feet.
Length of inner dock	235 „
„ outer dock	216 „
„ Caisson bed between 1st and 2nd docks	13 „
Width of entry at top	85 „
„ over sill and on blocks	62 „
„ of entry from 1st to 2nd docks on sill	51 „
„ of 2nd dock on blocks	47 „
Greatest water on blocks at ordinary spring tides	21 feet.
Rise of tide { Springs	8 ft. 9 in.
Rise of tide { Neaps	5 feet.†

Shoal.—A rocky patch half a cable in extent, having 14 feet on it at low water spring tides, with from 19 to 20 feet around it, lies N.W. ¼ W., distant nearly 7 cables from the entrance to the Cosmopolitan dock.

Slips.—There are two Patent slips; one at Belcher bay, adapted to vessels of 1,200 tons; and the other at East point adapted to vessels of 300 tons.

TIDES.—High water about the period of full and change occurs at 10.15 (approximately). The mean range of the higher tides is about 7 feet. The range of tide is subject to a large diurnal inequality; and is also affected by the winds which may increase or diminish the range by one foot or more. From October to March (the period of the N.E. monsoon) the night tides rise the highest. From April to September (the period of the S.W. monsoon) the day tides rise the highest. The highest night-tides (which occur between October and January) rise about one foot higher than the highest day tides which occur from May to September. At all seasons of the year the tides are most irregular off the mouth of the Canton river. It so occurs that the night tides are the higher, and consequently stronger, during the N.E. monsoon, and similarly the day tides in the S.W. monsoon. A tide of 10 feet rise at Canton or Whampoa is generally owing to a freshet or a strong southerly wind.

DIRECTIONS.—Hong Kong road is generally approached by sailing vessels from the westward, which side is protected by Green island and Kellett bank, the latter extending nearly 1½ miles northward from the

* The steam ship *City of Peking* of 5,079 tons, used this dock in March 1880.

† Navigating officer's Remark Book, *Iron Duke*, 1881.

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island, with an even depth of 3½ fathoms. It may also be approached from the eastward through the Lyemun Pass during the N.E. monsoon, but the winds are generally baffling under the high land, for which reason it is not much used by sailing vessels.

When abreast Green island, if the vessel be of heavy draught, keep the peak of Lamma island (Mount Senhouse, 1,140 feet high) open westward of Green island S. ¾ E. until Devils peak (on the mainland near Lyemun pass) is in line with the White rock on the south point of Won-chu-chau or Stone-cutters island, when a S.E. by E. course will lead northward of Kellett bank, and direct for the anchorage.

Vessels of proper draught can proceed over Kellett bank, on which the least water is 20 feet, or through the 4-fathoms channel between Green island and the south part of the bank, by passing about 1½ cables northward of the island, and then steering for the road.

For Steamers; the best approach to the anchorage from the westward is through the Sulphur channel, between Green Island and Hong Kong), which though only two cables in width, is free from dangers.* It has depths of 10 to 12 fathoms in the middle, shoaling to 8, 6, and 4½ fathoms after passing the small islet eastward of Green island.

Stone-cutters Anchorage.—This anchorage, between Kowloon peninsula and Stone-cutters island, is much used during the typhoon season, a signal for one of those dreaded gales, sending there all the large junks, many steamers and vessels of war for refuge. The east side of Stone-cutters island is foul, and off the north-east point a ledge extends a distance of one cable to the south-east. Vessels drawing less than 14 feet may enter eastward of the island, but ships of greater draught should take the western entrance. A rock, awash at low water, lies 140 yards S. 1½° E. from White rock, and there is another above water to the N.W. of it.

LIGHTS, Green Island.—(Off Sheegthong head, the N.W. extreme of Hongkong.) This is a fixed dioptric light of the 4th order, elevated 95 feet above the sea. It shows *red* from S. by E. ½ E. through East to N. by E. ½ E.; *green* between N. by E. ½ E. and N.W.; also *green* between S. by E. ½ E. and S.S.W. ¼ W. Throughout the remaining 111° it is obscured by the island. It should be seen in clear weather a distance of 14 miles.

Cape D'Aguilar or Tylong head (at the S.E. extreme of the island). (A *fixed white dioptric light* (1st order), 200 feet above the sea) should be seen 23 miles in clear weather. It is visible between the bearings of S.W. and N.W. ¾ W., excepting where the Ninepin and Waglan

* It is not recommended for *sailing vessels*, except with a fresh *fair* wind blowing *right through*.

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islands intervene. Obscured between N.W. ¾ W. and N.W. ¼ N. by Soon Kong island. Visible between N.W. ¼ N. and N.N.W. Obscured between N.N.W. and N.E. by N., by the Lochow, Pootoy, and Lema islands. Visible between N.E. by N. and E. by N. ⅛ N., except to vessels when south-westward of the Samoun group. Visible over Tathong channel, with the exception of a small portion obscured by Shicko head. The tower is of stone; the dwellings and boundry wall white.

Cape Collinson.—This light, *white and red fixed*, is 200 feet above the sea, and should be seen in clear weather 6 miles. It shows *white* to the eastward between the bearings of N.N.W. and S.S.E., and *red* to the westward between S.S.E. and N.N.W. Vessels bound for Victoria harbour from the northward and eastward, by keeping within the white sector of cape Collinson light, will avoid the Bokhara and Tathong rocks, also the rocks extending from the east point of Sywan bay.

Local.—A *green* light is usually shown at night from the head of the Government dockyard pier; and *red* lights from Green pier and Pedder's wharf.

TYTAM BAY and HARBOUR.—There are several bays on the southern shore of Hong Kong, all of which are safe for small vessels; but at the south-east part of the island is Tytam bay, an inlet 2½ miles deep, 1¼ miles wide at entrance, free from danger, and carrying a depth of 10 to 6 fatboms. Tytam head, the western point of entrance, is a high bluff with 13 and 14 fathoms near it; from thence the western shore of the bay trends about N. by W. three-quarters of a mile to a small sandy bay, with a rocky islet fronting the beach. About half a mile northward of the islet the land forms a round projecting point, and northward of this point is a larger bay, with a sandy beach, in which is Tytam village.

Tylong head, or cape D'Aguilar, off which are two green islets, forms the eastern point of entrance to Tytam bay, and from thence the eastern shore of the bay bends round to the northward for 2 miles, and terminates in Tytam harbour, carrying 4 to 6 fathoms; but its head, to the north-west, is shoal and rocky. This bay would be useful to a vessel in the event of her being near Wag-lan at the close of the day, with the probability of a dark and tempestuous night, for by running in she will at any rate be snug, even if there should be a typhoon during the night. If wishing to anchor in the upper part of the bay, be careful to avoid the fishing stakes, of which there are a great many in the middle of the bay.

Water.—At the head of Tytam harbour is a rivulet of fresh water, which, however, cannot be procured without inconvenience when the tide is low. Water may be obtained at Tytam village on the western shore of the bay.

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TIDES.—There is very little tide in Tytam bay, and, like all the places hereabouts, it is difficult to fix the time of high water, owing to the variety of channels, and the wind greatly influencing the tidal streams; but the rise and fall is about 7 or 8 feet at springs, and about 3 or 4 feet at neaps. The ebb sets to the eastward between Lo-chau and Hong Kong.

DIRECTIONS.—If bound to Tytam bay from the eastward the route may either be taken northward of Wag-lan, Sun-kong, and Lo-chau, through the Shingshimún pass; or southward of this group through the Lema channel, and round Castle rock to the westward of Lo-chau. But the northern passage is preferable, for after opening the bay a vessel may haul to the northward into any convenient berth; whereas, by taking the southern route, if the wind be northerly, she will have to work in.

If Shingshimún pass be taken, give Wag-lan and Sun-kong a berth of half to three-quarters of a mile, and steer for the pass, which is formed by the high island of Lo-chau to the southward, and the two green islets off Tylong head to the northward: in this track a vessel will carry 17 and 16 fathoms water from Wag-lan, and, by keeping in mid-channel, will have 27 and 30 fathoms deepening as Lo-chau is neared, and shoaling to 14 or 16 fathoms near the islets. The depths will shoal fast to 10 or 11 fathoms when about one or 1½ miles westward of the two islets. From thence steer for the anchorage off Tytam village, on the western shore, in 6½ fathoms. In this position a vessel will be well sheltered from all winds, except those from South, which cannot affect her much, as the islands and rocks contiguous to the entrance prevent much swell from rolling in.

To enter Hong Kong harbour from the westward, directions are given on page 91, and from the eastward on page 142.

LANTAO, or Ty-ho, the large high island lying westward of Hong Kong, is 14 miles long, N.E. by E. and S.W. by W., and its greatest breadth 5½ miles. About the centre of the island the land is very high, making in peaks, the highest and westernmost of which rises 3,050 feet above the sea level.

Light.—An iron beacon has been erected on the rock lying between Lantao and Chung islands, from which a fixed red light is exhibited.*

West Coast.—Close to the western shore of Lantao, 1¼ miles from the south point, is a peaked hill, which at high water is insulated. From

* The local steam vessels running between Hong Kong and Macao, usually take the passage between this Beacon and Chung island, keeping on the eastern side of mid-channel. This light is probably exhibited at the expense of the local steam companies.

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this hill to the point a mud flat extends about a third of a mile off shore, with only 2 fathoms water on it; therefore, in passing this part of the island do not decrease the depth under 7 fathoms, as the soundings will shoal fast from 17 to 7 fathoms near the edge of the flat.

About 1¼ miles N.N.W. of the peaked hill, and half a mile from the nearest shore, is a *rock* above water, having near it a depth of 15 fathoms, and between it and the shore 7 fathoms, decreasing quickly towards the latter. N.E. by N. 1½ miles from this *rock* is a bluff point, and eastward of the latter a bay, in which is the village of Ty-ho, where there is a creek or rivulet into which a boat may go at high tide. To the southward of the village are two bays, both of which are shoal, but fresh water may be procured in them.*

North Coast.—On the northern side of Lantao are two projecting points three-quarters of a mile apart, between which is the bay and village Sah-lo-wang; and directly fronting the eastern point of the bay and about a quarter of a mile distant, is a small islet, having a *rock awash* off its north-west side. Between this islet and Saw-chau, 2½ miles to the northward, the depth is too small for a vessel of large draught at low water; towards Saw-chau is the deepest water, 3¾ and 4¼ fathoms, shoaling near the Lantao shore to 3 and 2¾ fathoms, on a soft mud bottom.

Immediately eastward of the above small islet, between it and Chu-lu-cock island, is another bay in which is Tung-chung village. Red point, the north-east extreme of Chu-lu-cock, has a remarkable rocky appearance, and is frequented by a company of stone-cutters, who cut the granite rocks into slabs for building. The south point of this island is so near to the Lantao shore, that in passing it is difficult to distinguish it to be an island. In Tung-chung bay the water is shoal, only 2 and 2½ fathoms; and there is but little water on the eastern side of Chu-lu-cock; from thence the northern shore of Lantao is not inhabited.

About one mile E.N.E. of Red point lies a small green island 230 feet high, and three-quarters of a mile farther in the same direction another small island 200 feet high, which are the Brothers of Dalrymple, or Motoe of the Chinese. A rock, 30 feet above water, lies about half a mile southward of the East Brother, and about 1½ miles off the Lantao shore.

The depths near the Brothers are 7 and 8 fathoms, shoaling from the eastern islet towards the northern shore into 4 or 5 fathoms, and making the channel narrow; a small reef borders the western and northern ends of the West Brother. According to Captain H. Smith, of H.M. S. *Druid*, there is a good channel with 8 or 10 fathoms between the East Brother

* *See* Admiralty Chart: East coast of China, Sheet 1, No. 2,212; scale, $m = 0{\cdot}23$ of an inch.

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and the large rock southward of it; the rock appears bold on all sides. From the East Brother the north-east point of Lantao bears E. by N. 4 miles.

South Coast.—The southern coast of Lantao forms two large but shoal bays. The larger and eastern bay, to the north-eastward of the Soko islands, has in it a small islet and some rocks above water, and a populous village at its head. The depth is 2 fathoms within the rocks, and 4 and 5 fathoms in the entrance of the bay, where there appears to be good anchorage.* The western bay is less capacious than the other, and carries a depth of 2 to 5 fathoms.

Patung, a high green island, lying off the east entrance point of the eastern of the above bays, and separated from it by a narrow channel, has close to its west side some rocks above water. A small vessel will find good anchorage westward of these rocks, anchoring with them bearing about S. by E., three-quarters of a mile distant, in 5 fathoms. Fresh water may be procured at the sandy beaches on the south shore of Lantao. In the channel formed between Lantao and Patung are depths of 7 fathoms; the ebb here runs to the eastward.

CAP-SING-MUN PASSAGE, or Throat Gates, formed between the north point of Lantao and the main, is separated into two channels by Mah-wan island. The channel on the west side of Mah-wan is generally used by steam vessels, but it is narrow, and the eddies caused by the strong tides are dangerous. The channel northward of that island should be used by sailing vessels, for it is wider, has good anchorage, a regular tide, and in the N.E. monsoon the advantage of being to windward.

BUNSANSIAH ROCK (Passage Rock).—This danger, in the southern entrance of the Cap-sing-mun passage is a *pinnacle rock*, awash at low water, having depths of 8 to 10 fathoms close around.

From the centre of this rock, the summit of Chunghue rock is in line with the *south* extreme of Chunghue island, bearing E. by N., and the *east* extreme of Cowechau island is in line with the *west* extreme of Lamma island, S by E. ¾ E.

DIRECTIONS.—A sailing vessel proceeding through the Cap-sing-mun passage from the westward, should keep close over to the mainland to avoid a reef, extending a third of a mile from the north-east point of Mah-wan: then steer in mid-channel between that island and Chung-

* Here H.M.S. *Cormorant* rode out an easterly gale, in September 1865, which lasted 48 hours. The anchorage was much exposed, but the holding ground was good, hard, stiff mud mixed with sand and shells.

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hue island, which lies a mile to the eastward, and after rounding the south end of the latter, if bound for Hong Kong road, steer for the west end of Won-chu-chau or Stone-cutters island.

SAW-CHAU, lying 3 miles northward of Lantao, and S.E. 4½ miles from Lintin, is a small narrow island nearly a mile long, with a sharp hummock on its north end.

Tong-ku, about one mile northward of Saw-chau, is higher and more rocky in appearance; and S.W. by S. from the south point of Tong-ku, and W. by N. from the north point of Saw-chau, are two rocks above water, about a mile distant from each island; the western is named White rock from its white appearance. The depths near the eastern sides of Saw-chau and Tong-ku are 5 to 9 fathoms, westward of Tong-ku, 4½ fathoms, and near the rocks 5 fathoms, at low water.*

URMSTON BAY, or Tong-ku harbour, bounded by the islands Tong-ku and Saw-chau on the west, and Castle Peak island on the east side, is a safe anchorage, and tolerably sheltered from all winds. The best berth is in about 8 or 9 fathoms, with Tong-ku peak just open of the south end of Lintin, and nearer the mainland than Tong-ku. This safe bay or harbour was named Urmston by the captains of the fleet who anchored there in August and September 1823, at the recommendation of Sir James Brabazon Urmston, President of the Company's factory at Canton during the discussion with the Chinese, relative to the affair of the *Topaze* frigate in 1821–2, at Lintin; the anchorage was found secure, with smooth water when it blew a gale from eastward. Fresh water was procured in abundance.

DIRECTIONS.—The approach to Urmston bay for vessels of large draught, is between the east side of the spit extending from the south side of Lintin, and the islands Saw-chau and Tong-ku; and then northward of Tong-ku, the depth there being 7 and 8 fathoms. The passage southward of Saw-chau has only 3¼ fathoms, and that between Saw-chau and Tong-ku 2½ fathoms.

The channel between White rock and the east side of Lintin spit is about 2 miles wide, with 7 and 8 fathoms, decreasing towards the spit to 5 fathoms. Working northward, do not stand so far west as to shoal to 5 fathoms, or to bring the east side of Lintin northward of N. by W. With the south end of Saw-chau bearing E.N.E. and Lintin peak North, a vessel will be on the southern edge of the spit in 4¾ or 5 fathoms, sand and mud.

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* *See* Admiralty Charts:—Canton river, Sheet 1, No. 1,782, scale $m = 1\frac{1}{2}$ inches; and Sheet 2, No. 1,741, scale, $m = 3$ inches.

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LINTIN ISLAND, lying W.N.W. of Urmston bay, is about 7 miles in circumference, and its summit terminates in a conical peak 1,190 feet high. A spit of sand extends about 4½ miles to the southward of the island, having a depth of 2¾ fathoms on its outer part, but only 9 feet within 2¼ miles of the island, and rather less in some places. The spit is tolerably steep-to on the west side, with 10 fathoms near it, and 4 fathoms touching its edge. When within 5 miles of the island, if the vessel is of large draught, do not when standing eastward towards the spit, bring the west end of Lintin, westward of N. ¾ W., or tack immediately after deepening to 9 or 10 fathoms; but in the night do not deepen to above 7 or at most 8 fathoms.

Lintin Bar.—A sandbank also extends 13½ miles in a N.N.W. direction from the north side of Lintin, and on its northern part is a narrow ridge called Lintin bar, the southern end of which, in 2½ fathoms, bears W. by N. ¾ N. from Fan-si-ak islet, and N.N.W. ¼ W. about 5¾ miles from Lintin peak. The least water on the bar is 12 feet, and its northern end in 2¾ fathoms lies N.W. by N. 10½ miles from Fan-si-ak, with Sam-pan-chau just open westward of the west extreme of Anung-hoy island.

The anchorage off Lintin is about 1½ miles from the sandy beach on its south-west side, in 10 or 12 fathoms; under 10 fathoms the water shoals quickly towards the island.

Water.—Fresh water may be obtained at the eastern extremity of the beach on the south side of Lintin; and occasionally a few bullocks and vegetables may be procured from the inhabitants of the village.

TIDES.—It is high water, full and change, at the entrance to the Canton River at 10h. 0m., and springs rise 8 feet. At the anchorage off Lintin at noon, and springs rise 7½ feet. The streams run nearly North and South, and the ebb in the freshes sometimes 5½ or 6 knots per hour. In the N.E. monsoon the neaps are very irregular, sometimes only one flood perceptible during 24 hours, with a small rise when the other flood should prevail.

FAN-SI-AK ISLET and White Rock.—Two rocky islets, the easternmost and largest of which is Fan-si-ak, and the other White rock, lie North 4¾ miles, from the peak of Lintin. When these islets are in one, E. by S. ¾ S., the southern extremity of Lintin bar is on the same bearing. The east side of the channel between the southern extremity of the bar and Lintin is bounded by mud-banks, with irregular soundings of 2½ and 3½ fathoms on them at low water.

LANKEET FLAT, extending from the north end of Lintin bar, across the channel to the shoal mud-bank on the west side, and N.W.

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towards Lankeet island, consists of sand and mud, with hard bottom in some places. The depths on it are $3\frac{1}{4}$ and $3\frac{1}{2}$ fathoms at low water, and $4\frac{1}{2}$ to $4\frac{3}{4}$ fathoms at high water springs; a vessel therefore drawing more than 20 feet should not pass over it until about half flood. Close to the northward of this flat, are usually some fishing stakes, with boats made fast to them, and others also between Lintin and Lankeet; care should be taken not to run over the boats, which generally show lights in the night.

LANKEET ISLAND, N.N.W. $\frac{1}{2}$ W. 19 miles from Lintin peak, is formed of two hills, sloping into a low point at the west end, where there is a well of fresh water by a small temple close to some trees; the island at this part is covered with earthen vessels containing human bones. A spit or flat extends S.E. by S. $2\frac{1}{2}$ miles from its south side, with only 2 and $2\frac{1}{4}$ fathoms over it at low water. Between this spit and a long narrow sand to the westward is the Lankeet entrance of the western channels of the Canton river, described on page 130.

TIDES.—It is high water, full and change, at **Lankeet island** at 11h. 20m., springs rise $6\frac{1}{2}$ feet.

Anchorage in Lankeet road.—To proceed up this entrance to an anchorage in Lankeet road, keep the highest peak of Ty-cock-tau just open of the outermost of the rocks projecting from the west end of Lankeet N.W. $\frac{5}{8}$ N.: with this mark on, a vessel will have $4\frac{3}{4}$ or 5 fathoms at high water, about 4 miles from Lankeet; and will carry rather less water till nearly abreast the west end of the island, where she will have about 6 fathoms in Lankeet road. This is a convenient place for a vessel to moor when circumstances require her stores or sick to be landed. All the space between Lankeet and Ty-cock-tau is shoal.

SAM-PAN-CHAU, or Boat islet, N. by E. $\frac{1}{2}$ E. $1\frac{1}{2}$ miles from the east end of Lankeet, is small, of middling height, resembling a boat turned bottom upwards, and the best guide for crossing Lankeet flat. An extensive rocky bank, partly above water, projects N.W. from it, and joins the shoal bank extending from Lankeet to Ty-cock-tau. There are regular depths of 7, 8, and 9 fathoms to the eastward of Sam-pan-chau.

DIRECTIONS to HONG KONG or CANTON RIVER through LEMA, LANTAO, and TAI-TA-MI CHANNELS.*—Lema channel, formed by the Lema islands on the south, and the Pu-toy group on the north, is about 6 miles wide, and safe

* *See* Admiralty Chart:—East coast of China, Sheet 1, No. 2,212.

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to navigate, with depths of 19 to 14 fathoms, soft bottom. This channel should, if possible, be always adopted by sailing vessels bound to Hong Kong or Canton river in the N.E. monsoon, to effect which they ought to make the N.E. head of the Lema islands, bearing to the westward. If the weather be thick, and the wind blow strong at East or S.E. it may be prudent to heave to, when land cannot be discerned above 3 or 4 miles.* The depths are 19 to 21 fathoms, close to the head, and about 18 fathoms at the entrance of the channel. If the weather will not permit the vessel to enter the channel, do not shoal under 25 or 26 fathoms, as in these depths she will drift clear outside all the islands.

If, however, the vessel should happen to be near the entrance of the Lema channel in the evening, and a typhoon is expected, she should run immediately for Tytam bay on the south side of Hong Kong, or for the Tathong channel, or the east Lamma channel, as may be most convenient; in either of which she will be secured from the tempest, if an anchorage is gained before night.

During S.W. or westerly winds, it will sometimes be found difficult to turn through the Lema channel from the eastward, as there is generally a set from West to East, occasioned by the ebb coming from the westward out of the numerous channels, and the flood from the S.W.; with a strong S.W. wind the stream runs about 1½ knots per hour to the eastward, only slacking a little when it ought to change its direction. Pu-toy island may be approached with safety to a quarter of a mile, and the whole north side of the Lema islands to half a mile.

Through LANTAO CHANNEL.—From about a mile southward of Pu-toy, a West course for 19 miles will lead to the entrance of Lantao channel, passing southward of Lamma and northward of Lingting, the depths decreasing from 17 fathoms off Pu-toy, to 12 and 13 fathoms southward of Lamma, and to 7 and 8 fathoms as the channel is approached; there are 12 fathoms in the middle of the entrance, decreasing to 7 or 8 fathoms towards A-chau. Lingting, which is of considerable height, and terminates at the summit in a conical peak, may be passed on either side as the wind requires. If passing southward, give a wide berth to the Needle rocks off its north-west point; and to those off its north-east point, if passing northward; but the channel northward of this island is preferable, and a vessel may work from side to side. In the night do not

* The *Nautilus*, of Calcutta, September, 1802, made Pedro Blanco, and after running to the westward, hove to for the night, keeping in from 18 to 14 fathoms. A strong easterly gale had prevailed in the night, which increased, with thick weather at daylight, when they found themselves close to the east side of one of the rocky islands northward of the Lema channel, on which the vessel struck, and soon went to pieces.

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approach the northern side of the island within 1½ miles to avoid the two small rocks (page 77) off its north-east point.

Chi-chau, when seen from the eastward, has a remarkable appearance, and is a good guide; it makes like a high, round, detached island, with distant rugged land westward of it, which are the islands of Lafsami and Chung-chau. Having entered the Lantao channel, the course through is N.W. by W., and the depths will be variable, not under 8 or 9 fathoms, nor above 25 fathoms. The ebb runs through in strong eddies, particularly in July or August, when its rate is sometimes 4½ knots per hour at springs. With a light wind, at times, it is difficult to manage a vessel here; on some occasions two or three boats, assisted by the sails, have been baffled in their attempts to tow the vessel's head round. After passing between Chi-chau and A-chau, the water will deepen in mid-channel towards Chung-chau and Lafsami, and close to the south-west point of Lantao, are 7 fathoms. Having rounded the point at a moderate distance, steer to the northward for Lintin, or to the westward for Macao road, as circumstances require; in the latter case the depths will gradually decrease to 5½ or 5 fathoms.

In turning through the Lantao channel, when standing northward, do not shoal under 7 fathoms in a vessel of large draught, nor pass the line of bearing between the south-west points of Lantao and A-chau. Between the northern Soko island and the Lantao shore, a good channel one mile wide, may be taken by a vessel when blowing fresh from the northward. In this case, after passing the south point of Patung, a small rocky islet will be seen in the bay on the southern shore of Lantao; steer to the north-westward until this islet is shut in behind the western point of the bay, when keep towards the south point of Lantao, and the depths will be 4½ fathoms, mud, between the point of the sandy spit and the Lantao shore.

From the small islet off the north side of Chung-chau, Lintin peak bears N. ⅓ E. 14 miles; the sand spit extending off the south side of Lintin is on the latter bearing, therefore a vessel will clear it if this islet is kept S. by E. until Lintin peak bears N. by E., then steer for the west point of Lintin. In a dark night, a N.N.W. or N.W. by N. course (according to the tide) should be steered from the middle of the Lantao channel until the water shoals to six fathoms, then steer North, keeping a good look out for the fishing stakes; on this latter course, if the water deepens above 7 fathoms, keep a little westerly until the vessel is near of above Lintin, where she can anchor. By not deepening above 7 fathoms, she will not be too near Lintin sand spit, there being 9 and 10 fathoms close to. The ebb tide, from the west end of Lintin to the eastward, sets South; but on the western shore its direction is S.E.

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Through TAI-TA-MI CHANNEL.—Proceeding towards the river through Tai-ta-mi channel, between the Lema and Kypong islands, after clearing Cambridge rock (page 82), steer northward for Lingting, passing between it and the Samoun group, and then through the Lantao channel; or pass between the Samoun group and Ai-chau, and proceed either for the Lantao channel or to the N.W., direct for Lafsami. Having approached Lafsami, keep within a mile of its western side, and of the south part of Chung-chau, to avoid the 4-feet needle rock*; after passing Chung-chau, steer for Lintin, or for Macao road.

If the channel be taken between the great Ladrone and Gap rock, or the narrow passage between the latter and the Kypong islands, steer northward, and proceed along the west sides of Ai-chau and Lafsami. Or if bound for Macao road, there is a more direct passage about a mile wide, with 13 fathoms water, between Pak-leak and Chuk-wan, then on the north sides of Tong-ho and Liungnib, and to the southward of Ty-lo, which track lies nearly in a direct line towards the road. Although this channel is safe, in the day-time great care must be taken to avoid the Raleigh rock (page 76). There is a safe passage between the Great Ladrone and Pak-leak, with 14 to 9 fathoms water, but recollect the sunken rock lying half a mile from the north side of the Little Ladrone, and also the Clio rock (page 76); a vessel taking this route should pass southward of Potoc.

To CANTON RIVER through GREAT WEST CHANNEL.—This channel, on the west side of the Ladrone islands, is generally used by vessels bound to Canton during the strength of the S.W. monsoon, and to do this they endeavour to fall in with the Great Ladrone bearing about North or N. by E.; but late in the season when the winds incline to the eastward, or at any other time when they are expected to come from the northward or eastward, it will be prudent for a sailing vessel to make the N.E. head of the Lema islands, and proceed towards the river by the Lema and Lantao channels, page 99. Here the risk of being horsed to the westward by the freshes setting out of the Great West channel is avoided, and a northerly wind will lead to an anchorage in the river. When typhoons happen on the coast, they generally commence in a moderate gale from the northward, which is a leading wind for these channels, and as the wind commonly veers to the eastward before it blows hard, a vessel with the first of the gale may get well up the river above Lintin, where these storms are less violent than outside among the islands.

* Described at page 79.

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As the approach to the Canton estuary is probably more safe than that of any other large river in the world, there being no sandbanks at its entrance, and the channels amongst the islands outside being mostly all free from hidden danger, a stranger should not hesitate to push through the nearest convenient channel without a pilot, if the weather is tolerably clear. But the streams must be attended to, as they set in varying directions amongst the islands to the south-eastward, according to the prevailing winds; a strong easterly wind generally producing a westerly current or tide, which abates in strength when the ebb should be setting to the south-east. If an outside pilot can be obtained at a moderate rate he may be useful, to run the vessel into some cove or place of shelter, if a storm should be approaching, or if she be in a disabled state. Macao road should not be used if there is an appearance of bad weather, but she should be run up the river well above Lintin.

About South 30 miles from the Great Ladrone, the depths increase to 27 or 28 fathoms; about 60 miles from it, to 42 and 44 fathoms; and soundings extend on the same meridian to about lat. 20° N.; from hence they continue westward towards Haïnan head; but converge towards the land, with deeper water eastward of the meridian of the Ladrone islands. A vessel falling in with the land in thick weather may easily distinguish whether it be that of the islands eastward of the Great Ladrone; for the Kypong and Lema islands have soundings of 23 and 24 fathoms close to; whereas the islands between the Great Ladrone and St. John to the westward have only 10 and 11 fathoms at a considerable distance outside. These are also large and of regular appearance, resembling a coast more than islands; but those to the eastward, are detached, high, and uneven, excepting Tam-kam, the largest of the Lema islands, which is long and of an undulating form.

The freshes out of Canton river set almost constantly from the south end of Montanha, along the shores of the islands to the westward, at the rate of one to two knots an hour, particularly with strong easterly winds; and although at times there seems to be on the surface a flood tide setting eastward, or into the entrance of the river, the freshes underneath continue to run westward, by which sailing vessels are rendered ungovernable, even in fresh winds. Many vessels from this cause, after getting near Montanha, or between it and Potoe island, have been drifted nearly to St. John island whilst making every endeavour, with moderate winds, to keep their heads to the eastward. Steering, therefore, for the Great West channel, never borrow near San-chau, or the other islands to the westward, unless it is blowing strong from the S.W., to avoid being drifted to the westward. The freshes abate at times, and then weak tides set to the eastward; but as these are not of long duration, a vessel should

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keep on the eastern side of the channel in deep water towards the Ladrone islands and Potoe, and anchor instantly if she finds the current drifting her westward.

In the strength of the S.W. monsoon, (as before stated in page 102,) endeavour, if the wind be steady between S.E. and S.W., to make the Great Ladrone, bearing about North, and avoid the islands to the westward; this is the more necessary after the middle of August, when easterly winds are likely to prevail several days together, as they are, more or less, at all seasons. If a vessel falls to leeward about St. John, in September or October, she will generally make a tedious passage to Macao if she keeps close along the islands, where the currents or freshes setting westward will oblige her frequently to anchor; as these freshes prevail only in shoal water, near the islands, the best plan to adopt is, to stand well off the land, and take every advantage of the favourable shifts of wind, to get to the eastward.

Having passed through the Great West channel, or if the vessel has anchored in Macao road, with a leading wind she may weigh with the ebb, if she can haul over north-eastward for Lintin; for the tide will then act upon her port bow, and keep her off the western shore: whereas with an easterly wind, the flood is likely to drift the vessel into shoal water near that shore. With a fair wind, steer about N.N.E. ½ E. from Macao road for Lintin; if it be night from 4½ to 5 fathoms are good soundings; for at low water springs, greater depth ought not to be expected, until several miles north-eastward of the road.

Turning up against a northerly wind on the flood, tack from the west side of the channel in about 4 fathoms, according to the vessel's draught, the lead being a safe guide along the western shore, where the bottom generally consists of mud. The islands eastward of Macao road may be safely approached, having 5 fathoms near them, and when past Chung-chau-si, the depth will increase to 9 and 10 fathoms towards Lantao. Working hence to Lintin in the night, stand in to 4½ fathoms in the west part of the channel, and do not deepen above 7 or 7½ fathoms to the eastward. Here, the tides become stronger as the vessel proceeds upwards.

In Macao road, and between it and Lintin, the tides are frequently irregular, setting in a different direction at the surface to what they do underneath, by which vessels are rendered unmanageable in light winds. The ebb is stronger, and continues longer than the flood; the freshes often running out below, when a flood tide at the surface is setting into the river.

LINTIN to the BOCA TIGRIS.—When within 7 miles of Lintin steer for its west point bearing about N. ½ E., and when abreast the

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point, run northward in soundings from 5 to 6½ fathoms: with a westerly wind, borrow on the west side of the channel; if it is easterly, keep in 5 to 6½ fathoms with the flood tide. It will be safe to proceed 9 or 12 miles above Lintin, even in the night, with a working wind, (the lead being a certain guide,) by tacking from the west side of the channel in 4½ fathoms, and from the east side in 6½ fathoms; but when about 6 or 7 miles northward of Lintin, tack in 5½ fathoms from the east side of the channel, for the deepest water is near the edge of Lintin sand, and if a large vessel begins to shoal on its edge to 5 fathoms, she will not have room to tack.*

Lantao is frequently obscured by clouds or haze, but when its summit is visible the west peak of that island affords a good mark for running up this channel in the day. Steering N. by W. or N. by W. ½ W. from the west end of Lintin, draw gradually the high west peak of Lantao on with the west end of Lintin, and continue to bring it more easterly until it is on with Lintin peak, or a little open eastward of that peak, and keep it so, until the vessel is more than half way from Lintin towards Lankeet. Then, if the wind is contrary, Lantao west peak may be brought nearly to the east end of Lintin, in tacking from the east side of the channel, and well westward of Lintin peak, when tacking from the west side; but on a nearer approach to Lankeet, the west peak of Lantao must not be brought westward of Lintin peak.

When within 5 miles of Lankeet, the west peak of Lantao must not be brought more westerly than touching the east end of Lintin, when on the west side of the channel; and to a considerable way open of the same when on the eastern side. Here the depths decrease, with only about a fathom more water on the east than on the west side of the channel. A vessel will pass eastward, (in 14 feet water,) of all the mud banks at the entrance of the Western channels (page 129) between Cum-sing-mun and Lankeet, by keeping the northern and highest peak of Kee-ow island west of S. by W. ½ W., and the summit of Lankeet west of N. by W. ½ W. The pilots sometimes get vessels on these banks in the night; but with those of large draught they are more inclined to borrow close to the eastward, whereby they have frequently grounded upon Lintin bar; it will therefore be prudent, when the pilot appears confused or uncertain of his position, to anchor before the vessel shoals her water.

From a position about half a mile off the west end of Lintin, a N. by W. ¾ W. course would lead fair through the channel to the east side of Sam-pan-chau, were the tides to run in that direction; but from Lintin they set N.N.W. and S.S.E. nearly as far as the north end of Lintin bar, and thence to Sam-pan-chau about N.W. by W. and S.E. by E.

* *See* Admiralty Charts :—Sheets 1 and 2 of Canton river, Nos. 1,782, 1,741 ; scales, *m* = 1½ and 3 inches.

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Steering northward, with the west peak of Lantao open a little eastward of Lintin peak, or keeping in 4¼ to 5½ fathoms, Lankeet island will be seen making like a saddle, and shortly afterwards two small islets or rocks will appear close to its eastern end. These rocks will be nearly on with the middle of the opening of the Boca Tigris when first seen, and should not be brought more easterly; nor in working ought they to be brought to touch the point of Tiger island, which forms the west side of the opening, until within 4½ miles of Lankeet; being then northward of Lintin bar, a vessel may edge over to the eastward. There is no good cross mark to know when clear of the bar; but a pagoda on the western shore bearing S.W. ⅔ W., will lead northward of its extremity. From the northern end of the bar, Sam-pan-chau is a little open of Anung-hoy point N.N.W. ½ W., and the little hill on the east end of Lankeet is N.W. ½ N., about 5 miles.

Shortly after the rocks off the east end of Lankeet are on with the middle of the opening of Boca Tigris, or rather more westerly, if the vessel is within 6 or 7 miles of Lankeet, Sam-pan-chau will be recognized and will then appear under the land, a little eastward of the high round summit of Anung-hoy, a high, round hill, sloping to a point on the west side, and forming the eastern boundary of the Boca Tigris. Anung-hoy peak in line with Sam-pan-chau hummock, N. by W. ¾ W., leads westward of Lintin bar, and eastward of Lankeet spit. With a working wind, keep Sam-pan-chau between the eastern shoulder of Anung-hoy hill and the west point of the same; but that islet must not be opened westward of Anung-hoy point until clear of the north end of Lintin bar.

With an easterly wind, to prevent being set by the tide towards Lankeet, keep on the east side of the channel, with Sam-pan-chau shut in a little eastward of Anung-hoy point, or nearly on with it. When within 4 miles of Lankeet, a vessel may stand well to the eastward in working, opening Sam-pan-chau considerably westward of the point, being then to the northward of the extremity of Lintin bar; do not, however, stand so far over as to bring Anung-hoy point to touch Chuen-pee, but tack before they come on, for farther eastward the water is shoal. After opening Sam-pan-chau of Anung-hoy point, which with a westerly wind need not be done until abreast Lankeet, steer direct for the land of Anung-hoy, giving Sam-pan-chau a berth to the westward of half a mile or more at discretion, in 9 or 8 fathoms; then the depths will be 9, 8, and 7 fathoms to the entrance of the Boca Tigris, increasing to 13 and 15 fathoms abreast south Wantong.

If in a vessel of moderate draught, a cast of 3½ or 4 fathoms hard ground be got before Lankeet is seen, in a clear night, she may be certain

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of its being on Lintin sand, and will deepen fast on hauling westward into the channel.

Through FAN-SI-AK CHANNEL.—If a vessel is drawing 23 feet water, it would be imprudent to attempt the channel on the east side of Lintin, it being very narrow just above and about Tree island, with a considerable swell in it when blowing strong from the northward. The southern part of the channel between White rock and east side of Lintin south spit, is about 2 miles wide, with 7 and 8 fathoms, decreasing towards the spit to 5 fathoms. In working northward do not stand so far west as to shoal to 5 fathoms, or to bring the east side of Lintin to bear north of N. by W. When northward of Ton-ku, if the vessel is of 20 or 21 feet draught, keep the eastern shore aboard, avoiding the spits of shoal water at the points of the islands, until off the north end of Mah-chau; the shoal extending from the south end of which will be avoided by not shutting Tree island in with Mah-chau or by not bringing the highest peak of Mah-chau westward of N. ½ W.; White rock in one with the north end of Fan-si-ak, is the mark for the south end of Mah-chau spit.

Thence to Tree island, when standing towards Lintin bar or Fan-si-ak bank, keep the lead going, and tack in 4 fathoms or less, according to the vessel's draught; but the lead will be the best guide, as the bank is much curved in shape. Standing eastward, do not bring the north or highest peak of Mah-chau westward of South, and when the south point of Sui-chan* bears N.E. do not bring the west point of Tree island westward of N. by W. ½ W., to avoid the shoal spit of 2 and 3 fathoms which extends S.S.E. from that island nearly a mile. Tree island is safe to approach close to the rocks; but on the Channel banks to the westward, the water shoals suddenly to 2¼ fathoms, irregular soundings, sand and mud.

When near the west end of Tree island, do not bring it to bear more southerly than S.E. ½ E., to clear the edge of the shore bank. Standing westward, White rock should not be brought eastward of the saddle on the east end of Lintin, or the east end of the fishing stakes No. 3 (in the chart) to the northward of N.W. by N. the lead not being a sufficient guide for the channel banks. If the fishing stakes be not removed, they appear to be a preferable guide to the land mark, being always discernible, but either may be used in clear weather. When within half a mile of the stakes No. 3, the passage becomes wider, extending from the shore bank to Lintin bar, with 4, 4¼, and 4½ fathoms at low water, shoaling gradually on either side, so as to render the lead a guide in tacking, the bottom being very soft mud.

* A high pagoda has been erected on Sui-chan island, forming a good mark.

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If close to Tree island with a leading wind, steer direct for the centre of the fishing stakes No. 3, and pass them on either side, as circumstances require.

There is another range of fishing stakes (numbered 4), S.W. ½ W. of No. 3, which will, when near them and bearing South, warn a vessel of her proximity to Lintin bar.

If proceeding up the RIVER.—*See* Directions, pages 110 and 116.

TIDES.—In the Fan-si-ak channel it is high water, full and change, at 1h. 10m., but the rise is irregular, especially at neaps, the rise and fall being then only 2½ to 3 feet, and 6 to 8½ feet at springs: velocity from 3 to 4 knots, and from 2 to 2½ knots at neaps.

A vessel proceeding up with a working wind should weigh instantly the tide slackens sufficiently for her to make any progress, in whatever part of the channel she may have anchored. The passage between Lintin and Fan-si-ak should not be attempted in vessels of large draught, having only 2½ to 2¾ fathoms in it at low water.

CANTON RIVER.

The CHU KAING or Pearl river, commonly called Canton river, rises about 30 miles north of Canton (or 100 miles from the sea) in two streams, which unite at 10 miles above that city; at this junction a long narrow stream connects it with the North river by two branches, one at Sam-shui, the other 10 miles from that place. The Tung kiung or East river, which falls into it above the Second Bar, drains a large central portion of the Kwang-tung province, a sugar district. The entrance of Canton river, formed between the islands of Chuen-pee and Ty-cock-tau, or perhaps more strictly between Ty-cock-tau and the island of Anung-hoy, is divided by the Wan-tong islands into two channels, the eastern of which Boca Tigris, is generally used by vessels of large draught; the western is called Bremer channel.*

CHUEN-PEE POINT, the south extreme of Chuen-pee island, is close to a small peak called Chuen-pee hill, and N.N.E. ¼ E. 1¾ miles from Sam-pan-chau. On the north-west point of the island is a small watch-turret, with a fort under it; and midway between this point and Chuen-pee point is *Pratt rock*, lying a quarter of a mile off shore, with 6 to 9 fathoms close outside.

Anchorage.—There is a small bay with sandy beach on either side of Chuen-pee point, and fresh water may be obtained in that on the eastern side; but vessels of large draught cannot anchor near it, the soundings

* *See* Admiralty Charts:—Sheets 3, 4, and 5 of Canton river, Nos. 1,740, 1,742, 1,739; scale *m* = 3 inches.

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being shoal on a sandy flat, extending eastward and south-eastward from the point. The anchorage is in 6 to 7 fathoms, about a third of a mile from the beach on the western side of the point.

TIDES.—At this anchorage it is high water, full and change, at 2h. 0m., and springs rise 7¾ feet.

ANSON BAY, between Chuen-pee and Anung-hoy islands, is *very shoal;* from the depth of 5 or 6 fathoms the soundings suddenly decrease to 2 fathoms within a line joining the north-west point of Chuen-pee and Anung-hoy point, affording only a harbour for boats in Junk creek.

BOWER POINT, the south-eastern extreme of Ty-cock-tau, forms the western point of entrance to Canton river. From this point to Sam-pan-chau, the west side of Chuen-pee channel is bordered by a shoal flat, over which boats only can pass to East and West Ow-chau, the two small islets lying southward of the point.

ANUNG-HOY POINT, the south-west point of Anung-hoy island, forms with Keshen point, half a mile to the north-west, the eastern side of the Boca Tigris. The principal fortifications for defending the strait are built on this face of Anung-hoy, and immediately behind them Anung-hoy peak rises to the height of 1,500 feet. These are the first to attract attention, and consist of a long range of *white granite* masonry pierced with embrasures at the water level, with a wall running up the steep in a semicircle, as a protection from attack in rear.

WANTONG ISLANDS.—North and South Wantong are two small islands lying nearly in mid-channel abreast Anung-hoy point, and form the western side of the Boca Tigris. They bear N.N.W. and S.S.E. from each other, a third of a mile apart, and are surrounded by a bank which extends 1½ miles in a S.E. by S. direction from the southernmost island, at which distance the depth is only 4 fathoms. These islands are completely encircled with white granite batteries.*

DIRECTIONS.—From mid-channel abreast Sam-pan-chau with a leading wind a N.W. by N. course for 4½ miles will lead to the entrance of the Boca Tigris; but with a turning wind be careful when standing towards Chuen-pee not to borrow too close to Pratt rock. When standing

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* A large fort is in course of construction at the eastern extreme of South Wantong island, in the Boca Tigris. Remark Book, Sub-Lieut. J. F. Stuart, H.M.S. *Sheldrake*, 1879.

The forts protecting the entrances to Canton have, it is believed, been very lately (1883) strengthened and augmented, in view of threatened hostilities with France. The above descriptions cannot therefore be considered as completely trustworthy. —R.H.N. 1884.

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westward towards the shoal flat extending south-eastward of South Wantong, tack before the eastern extreme of Tiger island touches the eastern part of the fort in North Wantong.

The BOCA TIGRIS has deep water and uneven bottom, and is much contracted by Chain rock, above water, lying E.S.E. a quarter of a mile from the east point of North Wantong; and although the passage between it and Anung-hoy point is too narrow for working a large vessel, she can always back and fill through with the tide. The tide runs strong in eddies, and vessels generally keep nearest the eastern shore in passing. If detained here by the Chinese authorities, the best position to anchor is in 7 to 8 fathoms, about a quarter of a mile northward of North Wantong, taking care to avoid the *Wantong rock*, lying North nearly a cable from its eastern point.

BREMER CHANNEL westward of the Wantong islands carries a depth of 10 to 5½ fathoms, and was frequently taken by Her Majesty's ships during the operations in Canton river in 1841. If intending to use this channel, the first village seen to the northward of Bower point open south of the first bluff point above Ty-cock-tau fort (this latter point has the appearance of an island), will lead southward of the south extreme of the shoal flat off South Wantong; and the east extreme of Tiger island just open westward of the west end of South Wantong, will lead along its western edge in 5 fathoms. When abreast North Wantong, about 1½ cables from its west point, steer about North to avoid the shoal flat on the western shore.

DUFF ROCK.—This dangerous pointed rock, with only 18 feet over it, and 7 to 9 fathoms around it at low water, lies N.N.W. ⅔ W. nearly a mile from the eastern end of North Wantong, with the small round hummock on the western part of South Wantong seen over the western slope of North Wantong (between the small redoubt with a tree on it and the point), the high land of Geefu island touching the western brow of Tiger island, and the eastern extreme of North Wantong in line with the south-eastern extreme of Sam-pan-chow. A vessel will pass eastward of the rock by keeping Sam-pan-chau open of the east end of North Wantong, until she has approached Tiger island so near as not to see the high land of Geefu to the westward of it.

TIGER ISLAND.—N.W. ½ N. 1¾ miles from the east end of North Wantong is the Tigers Claw, the south-east extreme of Tiger island, a remarkable high island, called by the Chinese Ty-fu, the summit of which appears cleft. A shoal extends S.E. from the Claw, and at the distance of a ¼ of a mile, the depth is only 3¼ fathoms. There is a fort on the north-east side of the island. This island, the upper end of which is a remarkable mass of rounded granite with precipitous sides,

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rises to the height of about 400 feet. On its eastern face stands a battery similar to that of Anunghoy, which completes the defence of the river entrance.

Above Tiger island the river banks become more clearly defined, and assume the character of alluvial flats for many miles.

BATE ROCK, discovered by the late Captain W. T. Bate, R.N., in 1857, lies 2 cables northward of the north side of Tiger island, with the fort on that island bearing S.E. ¼ S.; the highest part of the island (eastern summit) S. ⅔ E.; and the north-west extreme of the island nearly in line with a small granite boulder on the summit of the hill on the western shore of the river S.W. ⅞ W. It has only 14 feet on it, is steep-to, there being 10 fathoms mud close to the eastward, and 7 fathoms between it and the island. To pass outside or north-east of the rock, keep the east extreme of North Wantong open of Tiger island fort.

TOWLING FLAT.—About a third of a mile eastward of Tiger island fort, is a projecting elbow of Towling flat; this and the Towling sand are much increased, having extended considerably to the westward since the survey of this river in 1840. The sand had become in 1860 an island covered with vegetation, and never wholly under water even at the highest tides. The old mark for the western edge of the flat in 3 fathoms, was Tomb point (the next point north-west of Chuen-pee point) in line with Keshen point S.E. ⅔ S.; but there is now a 1¼-fathom patch outside this line, and Tomb point therefore must be kept well open in passing. Vessels turning to windward from Boca Tigris towards Tiger island may stand to the eastward and shut in the high land of Chuen-pee with Anung-hoy until abreast the south-east point of Tiger island. If of large draught they had better back and fill, between the island and Towling flat, as the tides are strong.

The SMALL BAR is the name given, by Lieutenant D. Ross, I.N., 1815, to a small 2½-fathom bank of hard ground lying nearly in mid-channel, about 4¾ miles northward of Tiger island. Since that period the bank appears to have grown up and extended at least half a mile farther south. When surveyed by Captain Bate, R.N., in 1857, it was a mile in extent, north and south; the depths on the bank, were 2 to 3 fathoms.

CALCUTTA SHOAL.*—Situated near the centre of the small bar, has 10 feet water at low water springs. From the shoal Blake

* A gap in the Peak of Tycock-tow mountain, kept in line with Tiger's Claw, clears this shoal; after passing which by opening the gap between Tiger's Claw and Towling Island, good water may be kept until the marks can be brought on for 2nd Bar.—F. J. Harwood, Navigating-Lieutenant, H.M.S. *Swift*, 1883.

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point bears West ⅔ of a mile; Geefu rock (off the east end of Geefu island) south 4 miles; Saw-shee hill E. ½ S.; Second Bar pagoda N.W. by N. (northerly).

SECOND BAR. — The channel becomes very narrow abreast Second Bar creek, on the eastern shore of the river, and the services of a pilot are requisite (*see* page 116). The Second Bar is a large collection of shoals, 3 miles in length in a N. by W. ½ W. direction, lying between Second Bar creek and Second Bar pagoda. There are two channels over it, on either side of the central banks or middle grounds, which have varying depths of 13 to 17 feet on them and several shoal patches of 9 to 11 feet.

The Western Channel is about 2 cables broad, and carries 18 to 26 feet at low water; but two patches in it of 14 feet water lie respectively W. ¾ N. and W. by S. of the opening of Second Bar creek. The west point of Tiger island in line with Grassy Tongue, S. by E. easterly, leads through in not less than 14 feet at low water, touching on the banks.*

The Eastern Channel was in former years always taken by the pilots and considered easier; but since the discovery of the undermentioned knolls, this can hardly be said to be the case; nor is it recommended to attempt the passage without a pilot, the leading mark hitherto used, being now only of partial assistance.† Perhaps no directions that could be given would be wholly reliable; yet the following may be found useful when no pilot can be procured; but should be compared with the chart and used with caution. Entering the southern part of the channel at 7 cables above Amherst point, (but taking care to avoid a shelf *steep-to* extending 2 cables off the intervening shore) steer north a little easterly, towards Second Bar creek to get the leading mark on. Keep the mark on until "*Small Pagoda*" (south of Interview creek) bears W. by S., then turn quickly to N. ½ E. (northerly), and steer for the west side of the village between first and second creeks, until "Second Bar pagoda" and the summit of the headland under it, are in line (W.N.W.), then *starboard* the helm promptly to N. by W. ½ W. (westerly). When abreast the second small creek, bring the leading marks again into line and keep them so, until Second Bar pagoda bears W. by S., when the banks are cleared.

SUNKEN DANGERS in the Eastern Channel.— These consist of three knolls (composed of sandstone) in the fairway, each having a surface of about 17 square yards, and rising about 4 feet above the river bed, known respectively as Wang Lang, Tai Tub, and Tai Kweichan.

* According to Lieut. C. Prichard, R.N., a beacon has been erected on the round of the point on South Bank just above 2nd Bar. Remark Book, H.M.S. *Fly*, 1882.

† Wantong Tower, in line with the grassy edge of Amherst point S. by E. ½ E. (*see* chart, Canton River, sheet iii., No. 1740.)

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Wang Lang, the southernmost of the three, has 9 feet over it at L.W.S., and lies 500 yards from the east bank of the river, with Second Bar pagoda bearing N. 67° W., and See Cheetow pagoda, S. 75° W.

Tai Tub, the middle knoll, bears N. 24° E. distant 150 yards from Wang Lan, has 12 feet over it at low water, and lies 405 yards from the bank, with Second Sar pagoda bearing N. 69° W., and See Cheetow pagoda S. 74° W.

Tai Kweichan, the northern knoll, has 11 feet over it at low water, and lies 507 yards from the bank, with Second Bar pagoda bearing N. 72° W., and See Cheetow pagoda S. 70° W.

EASTERN CREEKS to TUNG-KUAN.—The town of Tung-kuan, which lies about 10 miles eastward of Second Bar, may be reached by two principal creeks, each of which has several outlets. Sawshee channel is the main entrance of the southern of the two, but it may also be gained from the southward by Chimmo creek east of Towling flat, by Anunghoy creek just above the Bogue forts, and by Junk creek which falls into Anson bay above Chuenpee point. The northern channel to Tung kuan may be reached from Second Bar creek, from Tszekee and Escape* creeks 2 to 2½ miles above Second Bar, and from the junk passage north of First Bar island.

BLENHEIM and WHAMPOA PASSAGES.—At 3 miles above Escape creek, and 5½ above Second bar, the river divides into two main branches, the Whampoa and Blenheim passages, which meet again at Honam point, just above the city of Canton, and opposite the foreign settlement. By the Blenheim or southern passage the distance to Honam point from the junction is 16½ miles, and by the Whampoa or northern passage 14 miles. Canton lies on the latter below Honam point, and 8 miles below the city is Whampoa, the anchorage for foreign vessels. About Whampoa the river in some parts is not navigable, even at springs, by vessels drawing more than 13 feet, so that those of heavy draught have to proceed to Canton by Blenheim passage.

Lights and Beacons.†—*See* page 119.

TO WHAMPOA AND CANTON.

FIRST BAR ISLAND.—At 2 miles above Escape creek, and near the east bank of the river, is First Bar island, low and flat, westward of which are the four flat islands, smaller but similar, and then the larger Danes Island, the western part of which is covered with hilly ground

* For extension of bank off this creek, *see* page 123.

† On the shore opposite Davis island (in Belcher reach) is a beacon showing the depth of water on second bar. It is surmounted by a ball; and painted black, white, black.—Remark book, H.M.S. *Linnet*, 1883.

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which marks the position of Whampoa. The four channels between Danes island and the four low islands are shallow and not used by foreign vessels, the navigable passage into the northern or Whampoa passage being that which is next westward of First bar island, carrying from 20 to 30 feet water.

Flat Island Beacon, originally constructed to mark a mud spit projecting off the S.E. end of No. 1 Flat island, is now in ruins. *The spit has extended,* and a portion reclaimed, so that the ruin now stands within the embankment.

First Bar is formed at nearly half a mile above First Bar island, between a shoal bank of sand bordering the west side of First Bar island, and a shoal spit projecting from the eastern point of the low Flat islands. The least depth on it in 1857 was 20 feet.

Brunswick Patches, on one of which the *Brunswick* struck in 1798, and the *Wyndham* was totally lost in 1815, lie about two-thirds of a mile above the west end of the Fist Bar island, on the northern shore of the river. The rock on which the *Brunswick* struck is described to be about half a cable long, N.E. by E. and S.W. by W., with irregular depths of 8 to 18 feet on it at low water. The Second Bar pagoda bore from it S. by E. ¾ E.; Whampoa pagoda W. ½ N.; west extreme of First Bar island S.E. ¼ E.; and a large house inland N. ¼ W.; and with this house bearing from N. ¼ W. to N. by E. a vessel will be on the line of the rock.

There are channels between the patches, and to the southward of them; but the narrow 4-fathoms channel northward of the patches, close along the north shore, is most generally used. North Shore pagoda in line with the bluff point inside the Rocky head on Louisa island, N.W. by W. ½ W., leads south of the patches, but over 15 feet at low water on the edge of the bank off No. 1 Flat island.

WHAMPOA.—Above Brunswick patches, Cambridge reach, which leads up to Whampoa, is clear and deep, excepting that for vessels of deep draught, a shelf that extends northward from the Flat islands, has only 18 feet on its edge in mid-channel. Then is reached the Chinese town on the northern side of Danes island, known to foreigners as Bamboo town. Above this lie the premises of the Union Dock Company, next the hill with a chapel embosomed in foliage at its foot forming the Parsee burial ground, and then the British Vice-consulate perched on the brow of a hill, behind which lie the basins and workshops of the Hong Kong and Whampoa Dock Company. Fronting these is English reach, and above it, south-westward, American reach. Opposite is Sulphur point, formed by the confluence of Elliot passage (of which American reach is a part), and the direct channel to Hong Kong. Whampoa new town extends from Sulphur point along the left bank of American reach.

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The Anchorage is in English and American reaches, the best position being between the north sides of Danes and French islands, and Whampoa new town opposite. It is a safe anchorage with a moderate tide, in from 5 to 6 fathoms, soft mud bottom; there is, however, scarcely room for two large ships to moor abreast, which occasions the lower part of the shipping, when there are many arrivals, to lie moored in English reach, abreast the entrance of Junk creek.

TIDES.—At Whampoa, it is high water, full and change, in the month of March at 1h. 40m., in April, at 1h. 15m., and in May and June, at 0h. 30m.; and the rise at springs is 7 to 8 feet. In March the day and night tides rise to the same level. From April to October the day tides are the higher; and from November to February the lower. In May and June, the level of spring tides is 4 feet higher, and that of neaps 2 feet higher than in March. *

WHAMPOA DOCKS.—At Whampoa there are 4 mud docks and 5 on Danes Island, but all dilapidated. The Hong Kong and Whampoa Dock Company have two of granite, the Cooper, and the Hood Tsoon.

The dimensions of these are as follows:—

	Cooper Dock (of granite). ft.	Hood Tsoon Dock (of granite). ft.
Length over all - - -	500	350
Breadth of entrance - -	85	59
Depth over sill at ordinary spring tides - - - -	14	18
Rise of tide at springs - -	7 to 8	7 to 8
„ „ neaps - -	3 to 5	3 to 5

Cooper Dock,† the principal one at Whampoa, is on the north-west side of Danes island, under the cemetery hill. It can be used as either one or two docks, being fitted with two caissons, and can be pumped out in about 4 hours. There is a pair of shears, capable of lifting 50 tons, on the jetty, alongside which vessels can lie at all times of tide: both this and the Hood Tsoon Docks are fitted with every appliance in the way of caissons, powerful steam pumps, &c. to ensure safety and despatch in the work.

* In January 1884, at Whampoa barrier, it was high water at 7h. 0m. p.m., two days before new moon.—H.M.S. *Linnet*, 1884.

† The latitude of the outer caisson of Cooper Dock is 23° 6′ N., and its longitude 113° 25′ E., and is cut on the post. (Captain Edmond, P. & O. Company's steamer *Malacca*.)

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The workshops on the above premises, as regards repairs of ships and steam machinery, boiler, and blacksmith's work, and supervision of experienced Europeans, have been described as equal to those of Hong Kong (page 89.)*

DIRECTIONS for proceeding to WHAMPOA.—Having entered Canton river by the Boca Tigris, be careful when approaching Duff rock not to bring Sam-pan-chau to touch the east end of North Wantong, until the high land of Geefu island is shut in with the western part of Tiger island. In passing through the channel between the latter island and Towling flat, observe that Tomb point, on Chuen-pee island, kept well open of Anunghoy north fort, will lead westward of the western edge of the flat; and the eastern end of North Wantong kept open of Tiger island fort will lead north-east of Bate rock. With a working wind, a vessel of large draught had better back and fill through this channel, as the tides in it are strong.

After passing Tiger island keep the watch tower on Chuen-pee fort open of Anung-hoy north fort, until Bower point, the east extreme of Ty-cock-tau, is in line with the eastern side of Tiger island; then steer up the river with this latter mark on, and it will lead in the deepest part of the channel, but nearest to Towling island, in 7 or 8 fathoms water. When the remarkable high part of Geefu is on with the highest land to the westward, or bearing S.W., keep more eastward, and open Bower point again. Thence steer to the northward, pass on either side of the Small bar, and attend to the soundings on the chart.

The two Fairway marks for crossing the Second bar are given in page 112; but the services of a pilot are here indispensable to a vessel of 20 feet draught, unless the channel be previously buoyed; for the knolls or shoal patches being formed of sand and gravel mixed with mud, are subject to alter in position by the freshes of the river and the spring tides, which also render the navigable channel changeable. A pilot can be obtained from amongst the fishermen on the spot, who then buoy the channel with their sampans, but sufficient time should be given them to sound with their bamboos and to take their stations properly, or else a vessel is likely to take the ground. Vessels often ground and lie in a dangerous state for a tide; and this often proceeds from two or three pushing over together, as there is no time to be lost after the water has risen sufficiently for a vessel drawing 23 or 24 feet to pass over.

Vessels of large draught proceeding up the river from an anchorage below the Second Bar in the N.E. monsoon, or with a weather tide, should

* It is doubtful if this is now the case (1882).

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be under weigh by the last quarter flood, to save the tide across the bar; for the channel between the knolls being very narrow, they must back and fill through; if of moderate draught they may weigh much earlier. The difficulty in crossing the bar is in ascertaining correctly the shoal patches on either side the channel, and it will be best to place the boats on them at the first of the flood. When the Second Bar pagoda bears W. by S. the bar is crossed, and the bottom will be soft and loose, unlike that on the bar, which is in parts hard and stony.

After passing the Second Bar, keep between a third and half a mile from the eastern shore, taking care to avoid the two *rocks* Sai-Sheklung (9 ft.) and Tai-Sheklung (11 ft.) until First Bar island is approached, when the river begins to be contracted and its navigation requires great caution. When Whampoa pagoda is observed just on with the northernmost clump or hill on Danes island, haul out more into the middle of the river to avoid the shoal ground off the south side of First Bar island.

SAI-SHEKLUNG ROCK, about one mile above the Second bar, and nearly opposite Nimrod creek, is 150 feet in length (parallel with the bank), and 100 feet in width, with a least depth over it of 9 feet at low water spring tides, and lies 300 yards from the raised bank of Pottinger island, with Mammal hill bearing N. 59° W., Second Bar pagoda S. 41° W., and See Cheetow pagoda, N. 26° W. Fishing stakes are placed on and beyond this rock from November to March yearly.*

TAI-SHEKLUNG ROCK bears N.W. ¼ W., distant about half a mile from Sai-Sheklung, and 575 yards from the East bank; it is about 150 feet in extent, with a least depth over it of 11 feet, and 4 to 6 fathoms close around, lying with High peak of Tiger island bearing S. 14° E., See Cheetow pagoda, S. 22° W., and Second Bar pagoda, S. 33° W.

As no safe marks can be given for leading between First Bar island and the easternmost of the Flat islands, towards the First Bar, it will be prudent for a stranger, if without a pilot, to buoy the south-east extreme of the spit extending off the eastern Flat island, and also the Brunswick patches. The best route appears to be, when the south Chop-house on the southern shore of the river bears S.S.W., to haul over to First Bar island to avoid the spit, and then steer in about N.W. ½ N., passing along the western face of the island at about a cable. The open pile beacon on the S.E. end of No. 1 Flat island marks the extremity of a mud bank. When Whampoa pagoda is seen clear to the northward of the Flat islands, steer for the northern shore, which must be skirted at about half a cable, passing

* Mammal hill is in lat. 23° 3′ 5″ N., long. 113° 27′ 20″ E.; it is a smooth round hill with conical summit, and is easily distinguished from the south-eastward, being the centre one of three cone-shaped hills.

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through the narrow 4-fathoms channel northward of the Brunswick patches.

As the northern patch is approached, or when the large house inland, mentioned on page 114, bears about N. by W., be careful in preserving the distance of half a cable from the shore, and when the house bears eastward of N. by E. the danger will be passed. Thence steer towards Whampoa through Cambridge reach, borrowing towards the northern shore. Entering English reach the southern or Danes island shore is generally preferred to avoid the shoal flat off Junk and Watson islands, taking care to give a berth to the cluster of rocks, covered at half-flood, near Jardine point, the east point of entrance to French river. The anchorage off Whampoa is in 5 to 6 fathoms, over soft mud bottom; but there is scarcely room for two large ships to moor abreast, which occasions the lower part of the shipping, when there are many arrivals to be moored in English reach.

WHAMPOA to CANTON.*—The lower part of the city of Canton is 8 miles, and the Shamien or foreign concession 10 miles above Whampoa. If proceeding by the Whampoa channel, as this passage is called, it is better to take a pilot for the first time, although for gun boats, the Admiralty charts are a sufficient guide if no radical changes in the channels of recent occurrence have been reported. Some caution may be required in passing the Whampoa barrier if the tide be strong, in which case it is preferable to hug the south bank at the mouth of Fiddler's reach. Another part where care is required is just below Canton, where the city is first fully opened out clear of Napier and Kuper islands, for a reef extends nearly a cable into the river from the south bank. When, therefore, the small Suburbs pagoda on the south-east or nearest angle of the city wall comes in line with Gough's hill,† which is a little to the right of the tall, square, conspicuous red pagoda of five stories, N.N.W. ½ W., sheer out from the south bank into mid stream. The rocky ground above the Dutch Folly, (as the *small island* with the fort on it, abreast the centre of the city is called,) has been recently buoyed and lighted, and now therefore presents no difficulty to navigation.

Dutch Folly Buoys.—Close to the Dutch Folly are two wooden buoys to mark the fairway. The *north buoy*, in 8 feet water, painted *red*, marks the western extremity of the channel, *northern* side, between the rocks, on which the depth is 4 feet at low water spring tides. A *red* light is placed on this buoy from sunset to sunrise. The *south buoy*,

* *See* Admiralty charts of Canton river, Sheets 4 and 5, Nos. 1,742 and 1,739; scale, *m* = 3 inches. If proceeding to Canton by Blenheim passage, *see* Directions on page 122.

† There is a fort on its summit.

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in 12 feet, painted black, marks the western extremity of the channel, *southern* side, between the rocks, and is moored close to the northern side of the rock, on which the depth is 2 feet at low water spring tides. A *green* light is placed on this buoy from sunset to sunrise.

ROCKS in Junk and Whampoa Channels.—The following rocks have recently been discovered :—

1. A pinnacle rock with 8 feet over it, lying about 2 cables N.W. of the north end of Pedder island, approach to Whampoa channel; from it Whampoa pagoda bears N. 85° W.

2. A rock of small extent, with 8 feet over it at low water, lying N. 68° W. distant 45 yards from the last-mentioned rock; from it Whampoa pagoda bears N. 85° W., and the small pagoda on the east end of Whampoa island S. 13° W.

3. A rock (*Powan*) about 50 feet in extent, on which the steam vessel *Powan* ran in 1874, with a least depth over it of 5 feet, lying in the Whampoa channel, 183 yards from the north bank of the river, with the Joss house having a pagoda on the top, bearing N. 83° W.; Inclined pagoda S. 82° W.; and Whampoa pagoda S. 34° E.

4. A rock of about 20 feet surface, with 7 feet over it at low water, lying W. ½ S. distant three quarters of a mile from Powan rock, and 155 yards from the south bank, with the Joss house having a pagoda on the top bearing N. 73° W.; Inclined pagoda S. 81° W.; and Whampoa pagoda S. 68° E.

5. A conical rock with 3 feet over it at low water, lying W. ⅓ N. from the last-mentioned rock, and 187 yards from the south bank, with the little pagoda northward of Napier island bearing N. 78° W.; Inclined pagoda S. 78° W.; and Whampoa pagoda S. 71° E.

Sunken Rock.—In addition to the above named rocks, there is a sunken rock, lying in mid-channel between Symons island, and the Whampoa shore. From the rock, the eastern extreme of Symons island bears N.E. by E. easterly. The western extreme N.W. westerly, and the Pagoda at the creek opposite Symons island on the Whampoa shore N. by E. ⅔ E.*

Reef.—A reef projects 207 yards from the east side of the entrance to a small creek on the south bank of the river, about three quarters of a mile above the fort on the east end of Napier island, with 5 feet over its outer edge, and less water inshore—from its outer edge, the little pagoda (northward of Napier island) bears N. 8° E.; Inclined pagoda S. 82° E.

LIGHTS and Beacons.—On the sunken rocks near Dutch Folly are three round beacons. Nos. 1 and 2, marking the *northern* (or starboard)

* This rock has been hitherto shown as a rock above water on Sheet IV., Canton river.

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side of the channel are of stone, painted *red*, and surmounted by lanterns from which *fixed red* lights that can be seen in clear weather 2 miles, are exhibited between sunset and sunrise.

No. 3, on the *south* (or port) side is of brick and stone, painted *black*, and from it is shown a *fixed green* light between sunset and sunrise, which is visible one mile.

CANTON.*—The city of Canton, the capital of the province of Kwang-tung, stands on the north bank of the river, about 31 miles above Boca Tigris, 70 miles from Macao, and 74 miles from Hong Kong. It is surrounded by a strong wall 5 miles in circumference, the foundation of which is of red feldspar rock, and the upper part brick. The wall varies from 25 to 40 feet in height, and is 20 feet thick, having an esplanade on the inside, and is accessible on three sides of the city.

The city is divided into two unequal parts by a partition wall 6 to 8 feet thick, running east and west, having four gates, and two water gates at its extremities, through which boats pass east and west into and across the new city. The north and larger division is called the old city, the western part of which is occupied by the Tartar population; the south division is the new city. The suburbs are to the south and west, equal in extent to the walled city, the houses being built close up to the walls on these sides. The country outside the walls is clear on the north and east. There are 12 outer gates, each defended by a two-storied guard-house which commands the wall on either side, the principal ones having an outwork in addition.

A ditch encompasses the wall, dry round the north sides, which are rather elevated; nearer the river the ditch and the canals within the new city and western suburb fill with the tide and empty at low water. In the northern corner of the city stands the Magazine or City hill, commanding its interior and the outside surrounding hills on the north; immediately below it is a large square building of red brick, called the five-storied pagoda, on the northern and most elevated angle of the wall. Gough fort is outside the city, on the other side of a ravine about 500 yards north-east of this building, and there is a rather lower ridge outside the north-western part of the wall which it commands. The population of the city and suburbs is estimated at about one million.

TIDES.—It is high water, full and change, in the river off Canton in March at 2h. 40m., in May and June at 1h. 40m., in September and October, 2h. 12m.; the springs rise about 5½ feet, neaps 4½ feet. During the N.E. monsoon the tides rise 2 to 3 feet higher in the night than in the day; but in the S.W. monsoon the day tides are the higher.

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* There are two dry docks, one 500 feet long, 85 feet wide, 14 feet on sill; the other 450 feet long, 75 feet wide, and 17½ feet on sill.

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The Foreign Concession is on Shamien point, above the city at the south angle of the western suburbs and facing the Macao passage. All the foreign consuls reside in the British concession, which lies to the west. The French concession occupies the eastern corner. It takes the name of Shamien from the mud flats which existed there previous to 1859, but which were subsequently filled in and an artificial island formed, surrounded by a massive embankment of granite on piles. Its frontage is of irregular oval form, 2,850 feet in length, and its extreme breadth is 950 feet, and of the enclosed area four-fifths has been appropriated to the British Government, and one-fifth to that of France. A canal, 100 feet in breadth, separates the concession from the suburbs. Besides the consular offices* and the residence of the Vice-Consul, there is a church, library, reading-rooms, &c., and there are two cemeteries within a moderate distance of the concessions. The Consul, for political purposes, resides within the city at an official yamun.

Shamien Anchorage.†—Off Shamien the river is broad, forming a commodious anchorage for large steamers, the deepest water, 18 to 22 feet and good holding ground, being within 150 yards of the river wall of Shamien, but sailing vessels are restricted to the anchorage of Whampoa.

A rocky patch, with 10 feet over it, lies 300 yards from the western end of the Shamien bund, in line with the Joss house on the Fa-T (Fati) shore, and with Shamien church steeple bearing N. 54° E.

Buoy.—On the northern extremity of the above-named patch (Shamien rock) there is a wooden conical *buoy, red and black chequered.* It is moored in 12 feet of water. Vessels entering, should leave the *buoy* on the *port* hand when anchoring.‡

Supplies, Trade, &c.—The markets of Canton are well supplied with provisions at moderate prices ; beef, poultry, and fish, fruit, and vegetables at all times, to which are added in winter, mutton and game in plenty.

War and rebellion, the opening of Hankow as a shipping port for tea, and the facility with which smuggling can be carried on, have robbed Canton of the pre-eminence it so long enjoyed in commercial prosperity ; of late years foreign trade has declined about one-half, and the native traders are rapidly absorbing in their own hands the dealings which before were the means of enriching foreign houses of business. Tea and

* British subjects arriving at Canton are required by the Order in Council of March 1865 to register themselves at H.M. Consulate within one month, under penalty of a fine of 10 dollars.

† A representation of a tide pole has been painted on the wall of the bund, Shamien island, indicating the least depth of water over the Tai-shek barrier.—Sub-Lieutenant T. Dundas, H.M.S. *Zephyr*, 1882.

‡ The red light formerly shown on this buoy has been discontinued since February 1884.—Ed.

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silk are the principal exports, the imports are cotton goods, rice, opium, &c.

In the year 1880, the number of British ships that entered and cleared was 1,769 of 1,917,624 tons; and the total number, 2,365 of 2,215,239 tons. The export trade amounted to 3,633,153*l.*, and the import to 985,608*l.**

Climate.—Canton enjoys a much more temperate and salubrious climate than most places situated within the tropics, and neither epidemics nor malaria prevail there. In ordinary years the temperature ranges from 42° in winter to 96° in summer; the extreme range is from 38° to 100°, but these are rarely reached. The seasons correspond with the period of the monsoons, the hot season being from May to October, and the cool season from mid-October to the latter part of April. The S.W. winds set in early in April, but do not gain force until May, when rain becomes abundant, and the thermometer rises to 85°, and even higher. June is a dry and sultry month, whilst in July and August frequent showers are of almost daily occurrence, that, with the strong monsoon, temper the extreme heat, which averages 80° to 88°. September is again sultry, but the nights begin to grow cool, and October, though warm, is usually not an unpleasant month. The first steady blast of the N.E. monsoon, in the early part of November, sending down the temperature to 55°, brings a sensation of bitter cold to the constitutions of Europeans, relaxed by the preceding heats; but the weather of the ensuing months, in which constant sunshine, a moderately cold, but agreeable temperature, and clear skies prevail almost uninterruptedly, is not to be surpassed in any quarter of the globe. Ice sometimes forms in January, and the thermometer has been registered at 29°. A fall of snow, 2 inches deep, occurred in February, 1835. Fogs are common in February and March. Great precaution must as a necessity be observed, even by long residents, to avoid exposure to the sun and chills, and this with temperance in diet, will ordinarily ensure immunity from sudden disease. Fever and ague, and sunstroke, are brought on by very slight exposures, and bowel complaints are the natural consequences of imprudent indulgence in fruits, cold beverages, &c., and much attention should be paid to suitable clothing. Chlorodyne, Lamplough's saline mixture, and quinine will always be found useful in this and similar climates.

To CANTON through BLENHEIM PASSAGE.—The Blenheim passage† leading to Canton, which vessels of large draught must necessarily use, was so named from the fact of H.M.S. *Blenheim* of 74 guns,

* From the report of A. R. Hewlett, British Consul at Canton, 1881.

† First discovered to be a ship channel by Richard Browne, Master of H.M.S. *Calliope*, 1840. These channels were surveyed in 1857.

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and drawing 23 feet, proceeding up to Brown reach in 1840, and anchoring there. On subsequent occasions vessels of 21 feet draught, have reached the anchorage below Hamilton creek, 3½ miles higher, and vessels drawing 17 feet have proceeded to Canton. The only parts where difficulty is experienced are the passage of the Honan spit, Tai-shek barrier, and Parker point bar.

Though 17 feet has generally been considered as the least water on the Tai-shek barrier, and the Honan spit (between Shamien and Macao fort), yet, it would appear, that even that depth cannot be relied on, except at the *night spring tides* (which are always the highest). Commander A. J. Errington, R.N., states that H.M.S. *Wivern*, drawing 16 feet 6 inches water, was compelled to wait for a night tide before being able to cross either of those shoal spots: he also gives (on the authority of the harbour master, Mr. Gunther) at the following dates, the depths of water at the highest day springs:—

5th of February 1883	-	- 15 feet 6 inches.
6th of February 1883	-	- 15 feet 3 inches.
7th of February 1883	-	- 15 feet 3 inches.
8th of February 1883	-	- 16 feet 3 inches.

Commander Collins, of H.M.S. *Swift*, also reports having sounded the passage from Shamien over the Honan spit at high water (2h. 50m. p.m.) on the 8th of March 1883, and found the depths to vary between 17 and 19 feet (least water 17 feet); and over the Tai-shek barrier on the 10th and 11th of the same month at high water, when he obtained a minimum depth of 16 feet 6 inches on the former date, and on the latter a few inches more than the tide pole, which registered 16 feet 10 inches. The bottom was very uneven, and the shallow soundings taken few, the majority showing 18 and 19 feet, with frequently no bottom at 23 feet.

A rock of small extent, having 10 feet over it at low water, lies nearly in mid-channel of Collinson reach, with hill (50 feet) on Danes island bearing N. 5° 30′ E.; the westernmost high peak (290 feet) on Danes island, N. 48° W.; and Matheson point N. 55° E.*

From **Escape creek**†‡ above Second bar, a mid-channel course is pursued until nearing the southern shores of the Flat islands. Close these

* Chinese Government notice dated 9th December 1880.

† The bank off the mouth of this creek is reported to have extended westward and to have shoaled considerably since the last survey; a depth of 7 feet being found 300 yards from the edge of the bank, and where formerly a depth of 24 feet was shown on the chart.

‡ A tide pole has been placed on the mud, on the west side of the river nearly opposite Escape creek, marked in feet and indicating the least water at the time on the Tai-shek barrier, being 3 feet less than that at the entrance of the Whampoa passage.—Navigating Officer's Remark Book, H.M.S. *Zephyr*, 1882.

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keeping very near to island No. 3, and also the south-eastern face of Danes island, but sheer well off as soon as French creek westward of Danes island opens out, and steer well over towards Terrace head in Kellett reach, a hill 147 feet high, on which the ground is cultivated in terraces from base to summit. At the head of Kellett reach is Larkins point, an earth cliff 40 feet high, and 1¾ cables below it is *Junk rock*, under water, 120 yards from the eastern shore. Above Larkins point fishing stakes extend half-way across the river from the south bank, but they present no obstruction as the channel is now along the northern shore for some distance.

Bremer point, having a group of hills with cliffs at their base, is next closely rounded to avoid a shallow middle ground tailing from High island half a mile down stream. High island, of 88 feet elevation, lies in the centre of the river, narrowing the northern or navigable channel to one cable. The Comus sunken rock,* 60 yards from the north bank further narrows this channel; it lies S.W. of the highest of the hills of Bremer point, and 1¼ cables east of the north point of High island which is very steep to. Above High island, is *Brown reach* which has a depth of 24 to 25 feet, and where H.M.S. Blenheim anchored. Above Galbraith hill point on the south bank of Brown reach the river splits round the low flat island of Changshan. Senhouse reach, the channel south of Changshan, is seldom used, the deepest water at its western part being only 11 feet. The northern channel is Maitland passage which carries deep water as far as the short cut which connects it with Elliot passage on the north; then the depth decreases to 13 feet (20 to 21 feet at high water springs), on either side a narrow middle ground of 10 feet. Keep along the north shore past Changshan, above which more fishing stakes are seen southward of the fairway. Above the next hilly ground on the south bank, and between it and Hamilton creek, the river is broad and deep, and without obstruction, and therefore affords excellent anchorage. Above this vessels drawing 18 feet cannot go.†

The Tai-shek Barrier.†—But if proceeding to Canton the deep water must be quitted for a narrow gulley along the north bank, carrying 10 to 12 feet, which leads up to the Barrier passage. Caution is required here for the channel‡ is irregular both in its conformation and depth, and

* There is a house abreast this rock, the only one in its vicinity. G. W. Balliston, Navigating Lieutenant, R.N., H.M.S. *Vigilant*, 1877.

† 17 feet and 1 or 2 inches is the greatest draught the pilots can take up to Canton; as there is never more water on the Tai-shek barrier. A ship of that draught can lie off the city *above* the Shamien rock buoy, if moored.—Navigating Officer's Remark Book, H.M.S. *Encounter*, 1882.

‡ The channel has been deepened and marked by beacons; and *red* lights at night.

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the middle ground of 7 to 9 feet which bounds it on the south is of the same character.

The barrier is an artificial obstruction of stones and piling constructed to prevent the approach of large ships to Canton, during the First China war. Recently, however, the passage through it by the northern bank has been widened to 100 feet, and deepened to 11 feet.

Tai-shek Barrier Beacons and Lights.—Two wooden beacons, 28 feet high, mark the eastern and western ends of the channel; they are surmounted by round wooden frames, their lower parts being painted red, central portions white, and remaining portions red. There is also a central beacon without a frame; it is painted red below and white above. From the eastern and western beacons are exhibited, between sunset and sunrise, 2 *red* lights, they are placed 24 feet above high water and can be seen in clear weather one mile. They mark the deepest water over the barrier.*

The course for the first half mile above the Barrier lies along the north bank, and there are shoals of 7 to 9 feet in the centre of the river, caused by this obstruction to the current, which are probably of a shifting character.

Parker Point Bar is situate at a crossing from this branch of the river into that from Canton of which Elliot passage leading to Whampoa is a continuation. It is shoal in consequence of being out of the scour of the tides of either branch. Its shoalest part, 8 to 9 feet, is between Parker and 49th points. Vessels of 17 feet draught have passed over after examination, and buoying the best channel.

Tai-mei Beacon and Light.—On the S.E. edge of the sand spit off 49th point (Marines Island) has been erected a spar beacon 24 feet high, surmounted by a square frame, and painted black, white, and black. From it is exhibited at a height of 21 feet above high water, between sunset and sunrise, a fixed *white* light which should be seen one mile.

Macao Fort Passage is a reach of 3¼ miles, leading straight up from Parker point bar to the foreign concession at Canton. Macao fort, a picturesque object on an islet in the reach, may be passed closely on the east side. To the northward of the fort lie two buoyed rocks (Macao Fort rock and Haeshin rock) between which vessels should pass: after this keep in the centre of the river for there are rocks below water on either side,

* At about half a mile below the Tai-shek barrier (on the same bank) is a spar beacon similar to the barrier beacons, which shows the depth of water on the barrier.

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close to the bank; and abreast Birds' Nest fort, just below the Honam suburb on the east bank, two other sunken rocks lie close together, 130 yards from the shore.

The ebb stream in Macao fort passage, at springs runs from 3 to 4 knots an hour.

The anchorage off Shamien has been already described on page 121.

Corvettes and gunboats have ascended the various arms of the river several miles above Canton.

Haeshin rock with a least depth on it of 6 feet at low water, lies N. 45° E. distant 92 yards from Macao rock, and 73 yards from the high-water mark at the rocky landing to the European cemetery, Macao reach—from it, the western extreme of Honan island bears N. 28° W.; tower on Macao fort S. 27° W.; and Bushy hill (146 feet), southward of Hamilton creek, S. 40° E.

Buoys and Lights.—Macao Fort rock buoy, from which is exhibited a fixed *green* light at night, is of wood, 6 feet in diameter, black and conical in shape. It is moored at the N.E. extremity of the rock, and lies in 10 feet at low water spring tides. From the buoy, the north end of Macao fort bears S. 22° W., and Chênham fort S. 60° E.*†

Haeshin rock buoy, placed on the south-western edge of Haeshin rock, and from which is exhibited a fixed *red* light at night, is of wood 6 feet in diameter, painted red, and conical in shape. It is moored in 10 feet at low water spring tides, and from it the tower on Macao fort bears S. 24° W., and the western extremity of Honan island N. 28° W.†

ELLIOT PASSAGE is an intermediate branch of the river leading to Whampoa from Canton, and is indeed the direct continuation of the Macao fort passage. It was originally a fine, deep water channel, but the large barrier 6 miles above Whampoa, of similar construction to those in the other passages, has caused the bed of the river, for one mile on either side the barrier, to silt up, and not more than 8 feet can with certainty be carried through the barrier channel, which is close along the south bank. At Whampoa, Elliot passage is entered from American reach. This and other intersecting creeks in the vicinity may be navigated with the aid of the Admiralty chart, having been surveyed in 1857.

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* Vessels proceeding up the river should leave this buoy on the *port* hand.

† Vessels should pass between these two buoys.—Chinese Official Light List, 1884.

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WESTERN BRANCHES OF CANTON RIVER.

DELTA of the CANTON and WEST RIVERS.*— Between Macao, Samshui, and Canton, on the western side of the estuary of Canton river, is a large tract of alluvial land, the delta of these rivers. A network of streams and canals intersect this space, which, from the greater elevation of the land on the Si kiang, discharge themselves into Canton river, and thus, together with the Tung kiang or East river, which drains a large central portion of the Kwang-tung province flowing into Canton river at its eastern side, cause the great volume of water in its estuary to be so disproportionate to its size. The greater portion of the delta has been reclaimed in times long past, by embankments, and the process is being continued at the present day.

The principal channels traversing this delta fall into the Canton estuary between Cum-sing-mun and the Second bar; besides which some small upper branches about Fat-shan, fall into the Canton river between Canton and the upper part of Blenheim passage. The principal of these streams, the Tam-chau channel, traverses the entire length from Sam-shui (at the junction of the Si kiang with North river) in a south-east direction, with branches to all the principal towns and districts in the delta. In the central district of Shun-tuk nearly all the channels are connected, and one, which passes south of the town of Tai-lung, joins them to the Si kiang 2 miles south of Kum-chuk. Besides these there is the narrow channel used by the *Nemesis* (page 128), which, entering from the Broadway 5 miles above Moto fort, runs through Liau-si-wan, and joins the Wang-mun or first channel north of Cum-sing-mun.

Between Cum-sing-mun and Lankeet are the Wang-mun, Tam-chao, and Ty-cock-tau channels. They enter the west side of the estuary through extensive mud banks, their course running through level lands dotted with many island-like hills. The waters are kept in their channels by artificial embankments, without which almost the whole of the rice fields would be flooded at high water. The rice lands are principally east of Tai-lung; west of that town the land, although having the same features (level with island-like hills) is more elevated, being above high water level, and cultivated with mulberry plants.

The embankments are wide, but being planted with fruit trees, with here and there the houses of labourers, leave but a paved path, about

* *See* Admiralty Chart of Canton river and its Western branches, No. 2,562, scale $m = 0{\cdot}46$ of an inch. These Directions were for the year 1859. Some of these channels are now (1882) blocked with barriers, and in following the directions, the chart should be closely consulted.

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6 feet wide, for foot passengers. The rivers and numerous canals are the ordinary mode of transport, as every field is approachable by a canal. The towns are also entered by water, the channels being staked across; in some cases an entrance is left wide enough to admit a large junk, the opening being closed by rude gates, as at Tam-chau; in others these barriers consist of rows of stakes, with their heads above high water, closely driven across the whole breadth of the river, leaving but a narrow and circuitous channel near one bank, through which the current runs with great strength, and often the stakes are level with low water.

The general course of the Tam-chao channel is from the north-west, as is also that of the Ty-cock-tau channel, which falls out of the Saiwan channel below the town of Saiwan. The Saiwan channel is entered from Canton river, north of Whitcomb island; the course up it is more westerly, and it joins the Tam-chau channel north-east of Tai-lung. Moneypenny creek leads from the latter into the Fat-shan branch above Haycock island.

The Tai-lung, which is south of the town* of that name, runs west from the Tam-chau channel, and by a winding course joins the Si kiang by the Junction channel. The Wang-mun receives three branches, the Nemesis from the south-west, and the Sailam and Kerr channels from the north-west; the latter also joins the Si kiang through the Junction channel. Besides these main channels are smaller channels at right angles to them, forming connexions at different points of their course. The principal of these have been explored, and all found to have more than 6 feet in them at low water springs.

TIDES.—In the month of February it is high water, full and change, in Cum-sing-mun harbour at 12h. 6m., and at Lankeet island at 11h. 20m. In March it is high water in the Tai-lung channel (Kerr point) at 1h. 30m., in the Wang-mun at 11h. 50m., and in the Junction channel at about 2h. At all these places springs rise 6½ feet, neaps 5½ feet, and neaps range 3¼ feet.

In the Saiwan, Tam-chao, Tai-lung and Junction channels the flood sets to the westward, and the ebb to the eastward towards Canton river. In the summer, when the day tides are the higher, it appears to be high water nearly all day at springs in some of these channels, owing to the day tide only falling about 2 feet.

NEMESIS CHANNEL.—The following extracts are selected from Sir J. J. Gordon Bremer's dispatch, dated March 1841, to point out the track of the H.C. steam vessel *Nemesis*, when forcing a passage from Macao to Whampoa *via* the Broadway :—

* The name of Tai-lung in the local dialect is Shuntuk.

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"On the 13th the *Nemesis*, with boats of *Samarang* in tow, weighed from Macao road, and proceeded over the flats between Patera and Macarira islands into the Broadway. On reaching Hok-tao point, at the entrance of Nemesis channel, Tei-yat-kok, a field battery recently constructed of 14 guns, was seen strongly posted on a rising ground on the left bank of the river (surrounded by overflowed paddy fields), which enfiladed the whole line of the reach leading to it. On entering the reach they observed on the right bank a new battery, scarcely finished, with ten embrasures, but without guns, and Hok-kang fort close to it, well built of granite, surrounded by a wet ditch, and mounting 14 guns and 6 gingalls. Abreast of these (which they flanked) the river was strongly staked across.

The *Nemesis* having got through the centre passage of the stakes, which was just wide enough to admit of her passing, arrived at 4 p.m. off the large provincial town of Heang-shan. The dense population thickly crowded the banks, boats, junks, housetops, the large pagoda, and surrounding hills; both sides of the river were packed with trading craft of the country, the centre of the river, which is very narrow, having merely sufficient space to allow the steamer's paddle-boxes to pass clear of the junks moored to its banks. At 6 p.m. the steamer passed on into a narrow shallow channel, scarcely more than the breadth of a canal, where she anchored head and stern for the night. At daylight on the 14th, weighed and proceeded up the river in the steamer's draught of water, and not broader than her own length, grounding occasionally on both sides; at 7h. 50m. arrived at the large village of Hong-hao, with a fort of the same name at the upper part, which flanked a strong and broad line of stakes 20 feet wide completely across the river, filled up in the centre by large sunken junks laden with stones. After making good her passage through the stakes, which was effected after 4 hours' incessant labour, she arrived at 4 p.m. off a military station, where she anchored for the night.

At daylight on the 15th, the steamer continued her course upwards, and at 7h. 30m. arrived off the large village of Tam-chau. On moving up to Tegnell, a large town on the left bank of the river, three forts were passed, all dismantled and abandoned, and on proceeding up to Whampoa three more dismantled forts were observed. At 4 p.m. the *Nemesis* came to in that anchorage, having in conjunction with the boats destroyed five forts, one battery, two military stations, and nine war junks."

JUNK FLEET ENTRANCE.—All the banks at the entrance of the channels, between Cum-sing-mun and Lankeet island, are cleared to the eastward in 14 feet by keeping the northern and highest peak of

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Kee-ow island west of S. by W. ½ W., and the summit of Lankeet west of N. by W. ½ W.

The Junk Fleet entrance has 15 feet in it. Steer in with Crag island bearing N.W. by W., until the highest peak of Kee-ow is S. ¼ W.; then steer N.W. by N. until Cone island summit is just coming on with south end of Off island, W. ¾ N., and Flat island with east side of Mud island, when steer N.W. ¼ W. to pass about 3 cables off Crag island. From this the course into the Wang-mun is W. ¾ S. 3 miles, and then W. ½ S. 3½ miles to the branching off of the various channels; the mud banks on both sides are steep-to, but the south was the most to be avoided some years ago as it was then being reclaimed; beyond this the chart is a sufficient guide.

TAM-CHAO CHANNEL.—Entering this channel, from off Crag island steer N.W. 2½ miles, until the summit of Off island is on with the south-west point of Crag island, which mark clears the spit formed between this and the Wang-mun in 8 feet,—10 feet being the greatest depth across the channel at this point; steer up with the above mark until the chart is the best guide. The mud bank on the north-east side of this channel is steep-to, and should be avoided, as it is being reclaimed. If wishing to proceed by the channel to the northward of the mud bank, from 3 cables off Crag island steer 1¾ miles, with the eastern ends of Crag and Cone islands in line, then N.W. 6 miles will place the vessel well in the Tam-chao channel; or if wishing to proceed to the eastward through the Swatchway, which has 6 feet in it, having run 1¾ miles on the above line, steer E. ¾ N., feeling the way with the lead, altering course to the northward until Cone island summit bears S.W., when steer N.E. into the Lankeet entrance.

The mud flats that are being reclaimed have stone groynes thrown across them, the outer extremes of which are at the edge of the deep water, and, being covered except at low water, are dangerous to navigation; they are generally marked with bamboos, with the leaves left on the upper ends, which when withering, look like yellow flags.

The Tam-Chao Channel is the largest stream in the delta, and discharges itself into the estuary of the Canton river about mid-way between Lankeet and Cum-sing-mun. The rocky hummock, 50 feet high, opposite Saiwan is an excellent guide into it from the Saiwan channel, the second turning to the southward being taken; the first turning being into McCleverty channel, which is very narrow in some parts, but a good gunboat passage, carrying 6 to 26 feet water.

LANKEET ENTRANCE, with 16 feet in it at low water, is entered with highest peak of Ty-cock-tau just open of the south-west extreme of Lankeet N.W. ¾ N. This mark leads westward of Lankeet

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spit; but on nearing Lankeet give it a berth of 3 cables to avoid the rocks extending S.S.W. 1½ cables from its south-west point. Having passed Lankeet, steer N.W. by N., until its peak bears S.E. ½ E.; then steer up for Black point, which may be passed at any convenient distance. The lead will be a guide to avoid the bank which extends from Lankeet to Ty-cock-tau; but the bank in the middle of the channel has but 6 feet on it, and is steep-to. There is a deep water channel on the south-west side of this middle bank, but as there are no leading marks it had better not be used. Having passed Black point, the vessel will be fairly in the river, and the chart will be a sufficient guide.

CANTON to SAM-SHUI.*†—The *Haughty*, *Forester*, *Staunch*, *Starling*, *Watchful*, *Clown*, *Kestrel*, *Woodcock*, and *Janus* gun vessels under the command of Capt. J. J. M'Cleverty, C.B., left the anchorage off Canton, 16th February, and proceeding down the river entered the Saiwan channel by Hills passage, which passes directly east of the Second Bar and Si-chi-tau hills. These passages meet at Forbes point, whence the Saiwan channel falls into the Canton river by three outlets, the one passing north of Whitcomb island (which is flat) being the best channel. A spit stretches half a mile off Forbes point to the south-east, on the tail of which are only 6 feet.

SAIWAN CHANNEL is easily navigated for 10 miles until nearing the town of Saiwan, which may be known by its pagodas, where the stream divides into two channels round Saiwan bank, a large middle ground of hard sand and rock, on which several of the vessels grounded both going and returning. There is a rock awash on its eastern extremity, which is in mid-stream.

Saiwan bank extends about 1¼ miles from the east point of an island which divides the stream above Saiwan. It will be avoided by keeping the south shore of the river aboard in approaching Saiwan, and hauling close round the first point westward of the Ty-cock-tau channel. From the north side, off Saiwan, the bank itself may be crossed in 6 or 7 feet at low water with the hummock 50 feet high on the opposite shore bearing S. ½ W. Eastward of Saiwan, the Mount and Ty-cock-tau channels lead out to the westward of Ty-cock-tau and Laukeet.

TAI-LUNG CHANNEL.—At 5 miles down the Tam-chau passage, the squadron turned abruptly to the westward round a sharp point (Bullock point, off which a spit extends 3 cables) into the Tai-lung channel.

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* Lieutenant C. J. Bullock, H.M. surveying vessel *Dove*, February 1859.

† Hill passage has now only 6 feet of water at low water spring tides, at its northern end, *see* chart of Canton River No. 2562, corrected to June 1882.

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Tai-lung Rocks.—After proceeding 3 miles by a broad channel an obstruction was found in a bed of rocks which bar the river at the western point of Brine island, which is flat, with Tai-lung pagoda bearing N. by W. ½ W. A passage having 6 to 8 feet at low water runs close to the bank north of these rocks which have about 4 feet water on them, and lie abreast the entrance of a small creek with numerous trees growing on its bank, the only ones in sight for some distance, and form a first-rate mark for the vicinity of these dangers.* This passage, which is about 50 yards wide, the junks use.

Between these rocks and Brine island is a 12-feet passage, very narrow and difficult, and made more so by the chow-chow water. There is deeper water in the narrow channel south of Brine island, but the banks of the island must be kept aboard to avoid the Tonze rock off the spur of Singletree hill on the south shore, and another on the same shore abreast the entrance of a cutting through the island. In this cutting are 3 to 4 fathoms, but it is very narrow at its north end, where the Woodcock rock (dry at low water) lies nearly mid-channel; pass west of this rock.

Clown Rocks.—About 2 miles above the Tai-lung rocks, on passing the mouth of the large branch towards Shuntuk, keep over to the north shore to avoid a bed of rocks on which are only 3 feet at low water, lying rather south of mid-channel; they are connected with the south shore about 3 cables above the point. To the south is the large town of Yunki, and in front of it on the bank is a small fort commanding the Shuntuk branch. A mile up the latter branch on the east bank near a small fort, is a landing place, from which a road, 6 feet wide, paved with flag stones, leads to the walled town of Tai-lung or Shuntuk. The inhabitants of this town and district have always been ill disposed to foreigners, on which account a military demonstration was made on the return voyage by marching troops through the town.

At 3 miles west of Yunki, the river trends to the south, the channel being very narrow, and after a sharp turn to the east suddenly emerges into Yellow channel, a broad reach, the connecting link of five channels.

KERR CHANNEL flows from the north end of the Yellow channel to the south-east, leading directly to the sea by the Wang-moun. There are two dangers in this channel about 3 miles below Yellow channel and 1¼ miles below the entrance of the Yunki junction, where the channel will be perceived to split round a low island, 4 cables north of which, and

* Cruise of the *Whampoa* steamer, November 1862.

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stretching half way across the river from the east bank, is the Hand rock of only 5 feet water. After passing this, the north point of the island must be steered for, passing close to the westward of it, to avoid the Mohr rock, of only 4 feet water, lying W. by N. a cable from the point and rather nearer the west bank. Thence a run of 4½ miles brings to the entrance of the Wan-tung junction with the Tam-chao passage. This junction, which is clear and has not less than 7 or 8 feet water, runs up towards a range 370 feet high, under which stands the town of Whampoa. The Yunki junction has only 6 feet at two places, but saves a distance of 3½ miles in proceeding to the south-east; near the Tam-chau passage it divides into two streams, the northern of which must be taken.

SAILAM CHANNEL, flowing from the south end of Yellow channel, also gains the Wang-mun by a course of 19 miles (equal in length to the Kerr channel). It has two bars of 6 feet water at 1 and 4 miles respectively from Yellow channel, and which are above and below the town of Sailam, to the north of which this channel passes.

JUNCTION CHANNEL joins all these passages with the Si Kiang. It is the northern of two, divided by a flat island, the southern, Junction bend, being longer and shoaler.

Forester Rock.—Proceeding to the westward by this channel, as soon as the western end of Junction bend opens, hug the north bank to avoid the Forester rock, awash at low water, with 5 to 7 fathoms on either side. The best guide for its position is the commencement of some rocky hills which abut on the north bank of the river, and abreast which it lies; it can be passed on either side, but it will be better to take the north side, as the channel is wider.

Mahning Bar.—Opposite the lime-burning village of Mahning, under the western part of these hills, is a low island with long spits from either end. The channel lies north of it, and continues close along the northern bank for a mile, where there is a bar 6 or 7 feet at low water, the river being very shallow right across. This also lies 2 miles east of the Fist cliffs, which mark the entrance of the Junction channel from the Si kiang.

SAM-SHUI to FAT-SHAN and CANTON.—The Fat-shan branch, which is the direct channel between these places, is said not to be navigable by vessels drawing more than 4 feet water; there has been, however, no means of verifying this report. About 2 miles below or eastward of Sam-shui, on this branch, stands the flourishing

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commercial town of Sai-nam (Hsi-nam), which probably might easily be reached by small river steamers. The rise and fall of tide here appears to be 5 or 6 feet.

CAUTION.—The above directions have regard to the state of the river in the years 1857–59, and it is more than probable that many alterations have taken place since that date, especially at the mouths of those branches and creeks which fall into the estuary or lower parts of the Canton river.

THE SI KIANG OR WEST RIVER.

The Si kiang or West river, also called the Blue river, is 500 miles in length from its source to its mouth which is 9 miles S.S.W. of Macao, and it receives in its course some large tributaries, and with them drains the entire province of Kwang-si. At Sam-shui, 75 miles from the sea, where its course turns from east to south, it receives the waters of the Peh-kiang or North river which rises in the northern part of the province of Kwang-tung. From the North river, and from the West river below Sam shui, are several communications with Fat-shan, Canton, and other parts of the Canton river, which are described in page 131.

BROADWAY to SAM-SHUI.*—From the Broadway (page 67) the Si kiang is entered by the Moto Mun (or Moto mouth) which is bounded on either side by high hills. Its general course is to the N.N.W. to its junction with the North river. At five miles within the Moto Mun, on the left bank, is the entrance of a narrow creek through which the steamer *Nemesis* passed into Canton river in 1841 (*see* page 128). At 9 miles above the north point of Creeper island, on the right bank, is a large branch, leading to the district town of Sun-wei, the position of which is marked by a conspicuous pagoda on a hill; at this part of the Si kiang the pagodas of Liau-si-wan are remarkable on the left bank, and in the distance to the northward, the conspicuous hill pagoda of Tai-lung.

At 5 miles above the Sun-wei branch is the entrance to the Kong-mun channel, which runs South 1½ miles, then S.S.E. 1½ miles to the mouth of a narrow creek leading to Kong-mun, in which lie many junks. The nearest distance the gun vessels could get to the fort commanding this creek was 2,100 yards.

* From remarks by J. H. Kerr, Master, R.N., Assistant Surveyor, H.M.S. *Actæon* during the cruize of H.M. gun vessels *Opossum*, *Staunch*, *Plover*, with the boats of *Sybille* and *Tribune*, under Commodore the Hon. C Elliott, R.N., C.B., October 1857. *See* Admiralty Charts:—General Chart of Canton and Si kiang rivers, and adjacent country, No. 2,562, scale, $m = 0{\cdot}46$ of an inch; and the Si kiang or West river, Sheets 1, 2, and 9, Nos. 2,733, 2,734, 2,735; scales, $m = 0{\cdot}72$ of an inch.

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At 3 miles above the Kong-mun entrance, and near mid-channel is Plover island, about 40 feet high; the squadron passed eastward of it. At 7 miles above Plover is Staunch island, which is small and low, with rocks off its extremes in the direction of the stream; just above Staunch on the left bank is Junction channel, (*see* page 133) leading to Canton river. North of this, a mile, is Soames fort, so named from the commander of one of the P. and O. Company's ships, who navigated the river to this point. Above this fort, on the left bank, is the town of Kum-chuk, 2 miles above which, in the centre of the river, is Opossum island, which has two summits and makes like a saddle. Pass north of it, abreast the town of Kow-kong, which with Kun-chuk are important as the centres of a great silk producing district.

From Opossum island the river has two channels, one on either side of two low flat islands, the united length of which is 4 miles; both these channels were used by the squadron, one going up the river, the other returning, but on both occasions they passed north of Opossum. The east channel leads past the large town of Sam-chau; the west channel up to the town of Ku-lo-wa, between which and Sam-chau is a ferry. In the west channel, 1½ miles above Opossum island, is a small creek, having a pagoda on its right bank, and what appeared to be a fort on its left.

Three miles above Ku-lo-wa* is a seven-storied pagoda on a low hill close to the right bank of the river, and at half that distance on the left bank is a pagoda on the low land. Above the seven-storied pagoda was the appearance of two channels; the east one, 4½ miles long, was used by the squadron, keeping near the left bank when off the north end of the island separating the channels. At the north end of the west channel,† on the right bank, is a pagoda. At 12½ miles above the seven-storied pagoda is Campbell island, which is about 40 feet high and rocky; the squadron passed east of it. Here the river narrows considerably.

Just abreast Campbell island on the right bank is a creek, on the north side of entrance to which is a patch of rock, probably covered at high tide. A pagoda stands on the summit of a low cliff, south of the entrance. On the right bank, 3 miles above Campbell island, is a pagoda; and at 6 miles, the junction of the Peh kiang or North river, in the embouchure of which lie two flat islands forming three passages, the two western of which have not been explored. The eastern, Sam-shui reach, is a narrow channel

* Off Ku-lo-wa there is a considerable ledge of rocks, about one foot above water extending some distance into the stream.—Cruize of the *Whampoa* steamer, November 1862.

† This west channel did not appear to be navigable, a sand-spit from the south bank running well across its mouth.—*Ibid.*

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which runs direct to Sam-shui, and joins a stream running almost direct to Fat-shan, page 133. Sam-shui is a walled town standing a mile inland at the north-eastern angle of the junction, and fronting it to the south-east is a nine-storied pagoda.

The country between Soames fort and Sam-shui is a silk district.

The least depth passed over by the squadron between Creeper island and Sam-shui was 6 feet at low water (or 12 feet at high water), which was just below the entrance of the Kong-mun channel; but as they did not search for the deepest channel, there is doubtless deeper water to be obtained.

SAM-SHUI to SIU-HING PASS.*—Proceeding from the Sam-shui junction, pass mid-channel through New reach (where there lies a flat island having a large white fort at its upper extremity), then keep along the north shore of Kwang-li reach, taking the north channel of the river, which splits round a richly cultivated island. The south channel is full of shoals, and a long spit runs out from either end of Kwang-li island; this channel was re-examined, and still found very shallow, by a party who made a trip to Wu-chu in the *Whampoa* steamer in November 1862, an account of which was published in the *China Mail*; they found the river generally deeper than the charts give,† but the water would probably be at a higher level in November than in February, when it is remarkable for its clearness, from which it has derived the name of Blue river.

FIRST BAR.—Proceeding by this north channel (Kwang-li bend), which is deep, after passing the village of Kwang-li, keep the north bank aboard but not very close. When clear of the island, the First bar is met, where the river is very broad abreast the town of Tau-kai. Not more than 2 fathoms were found here at two places, but in November 1862 there were $2\frac{3}{4}$ fathoms. This is 75 miles from the sea.

SIU-HING PASS.—Four miles above Kwang-li is the entrance of a fine pass, the river flowing amongst mountain ranges, which rise to the height of 2,000 or 3,000 feet. This pass, called the Siu-hing hap, is $3\frac{1}{2}$ miles in length, and nearly straight, and in its narrowest part from 200 to 300 yards wide; the water is deep, but its depth was not ascertained.

SHAO-KING, (or Siu-hing) a walled city of the second class, with an extensive suburb lying to the westward, stands on the left or north bank

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* Sam-shui to Wuchu-fu is from the survey and remarks of Lieutenant Chas. Bullock, R.N., in 1857. *See* Admiralty Chart of Si-kiang, Sheet ii.

† The soundings of the Chart are reduced to the level of February 1858, which is considered to be the lowest state of the river. *See* also "Tides and Current" on page 139.

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of the river, 20 miles above the Sam-shui junction, and 6 miles above the pass, in latitude, by observation, 23° 03′ N., and longitude, by rough computation, 113° 03′ E. The river here is 6 to 7½ cables wide, with a depth of 5 to 6 fathoms along the north shore.

TIDES.—The tidal influence was felt at Shao-king, there being a rise and fall of 3 feet or more in February, but the stream, though completely checked, never turned.

SHAO-KING to WU-CHU FU.—For 22 miles above Shao-king the river winds through a hilly country, opening out again near Narrow island, which appears in the centre of the river, but is joined by sand-banks to the north bank. The sands off this island are said to have increased, it is therefore advisable to keep over near Tree head on the south bank. The hills, varying from 100 to 1,500 feet in height, are in general densely wooded, and many of them are highly cultivated. Occasional rugged hills of marble are seen, one of which, of most picturesque form, crops out on the north bank of the river, and is called Kai-yak-kwan, or the Cock's comb, which it strikingly resembles. There is also a group inland 2 miles north of Shao-king, to which the name of the Seven Stars is given, after the constellation of the Great Bear.

From Kai-yik-kwan* (30 miles above Shao-king), by an easy navigation of 16 miles, the walled city of Tak-hing is reached, a thriving, prosperous place; and 3 miles above it the river takes a short sharp twist, round Steep point on the south shore, which must be closely and carefully passed to avoid the Flat rocks in the northern and central parts of the river, and the chow-chow water, which is liable to turn a vessel's head against her helm. Between this and Tai-lik-hau the water is said to be deeper than marked on the chart.

At 50 miles above Shao-king, and on the left or north bank of the river, a single mass of granite (in the form of a thumb) rises perpendicularly some 300 feet out of a range of hills of 1,400 feet elevation. Its local name is Kum-kwoh-shek, but it is also called Fa-pew, or the Flowery tablet, and is the most remarkable object in the river. After passing this, the navigation becomes dangerous, as the river bed is studded with rocks.

The Fapew rocks lie in the river south-west of the Flowery tablet, and to avoid them the south shore must be kept aboard. At the first bend above this, Fairies' bridge reef is said to extend two-thirds across the river from the point on the east bank which lies opposite the village of Tuching. After passing Tu-lok-heu, 3 miles above on the eastern shore, closely, to avoid the end of Tulok spit from the opposite shore, the west

* *See* Admiralty chart of Si-kiang, Sheet iii.

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bank of the river should be closed, and when passing the Red hills, endeavour to bring Fapew in line with the hollow between two hills bearing S.S.E. ½ E., easterly, which is said to lead in the best water across the Second Bar and between the Kok-heu banks on the east shore, and the Robinson, Janus, and Webster rocks on the other, in 3½ fathoms.* When the ruined obelisk on the west bank bears East, keep over towards that shore past the small walled city of Fong-Chuen (about 28 miles above Tak-hing), 2 miles above which the Kai, a tributary, falls into the river, at the entrance of which is an earthwork.

After passing close under the bamboo plantation to clear the Twin rocks in mid stream, keep close round the point and under the High bank, and when Watchful rock is passed keep the bamboo plantation open of the High bank near it, which carried the *Whampoa* across in 3 fathoms to the third Joss house below Wu-chu, which is a prominent object on the north side of the river. A search then made discovered nothing at the places marked "doubtful" on the chart, the pretended existence of which are due to the pilot of the *Watchful*, who pointed out, possibly with a view to magnify his office, every spot of chow-chow water as a rock. In sounding also between the third Joss house and Wu-chu fu, 3 to 4 fathoms were found at 100 to 150 yards from the shore, in which case the 4-feet patch on the chart which obstructed the channel in 1859 must have disappeared.

WU-CHU or **NG-CHU,** the frontier city of Kwang-si, is 75 miles above Shao-king. It stands at the confluence of the Fu ho, the stream on which is Kweiling, the provincial capital of Kwang-si, and this communication had the appearance, observed from the heights, of being easily navigable by gun boats. Its latitude by observation is 23° 28′ N. (22 miles north of Canton), and its longitude, approximately, 112° 14′ E., which must at present remain uncertain, as gloomy, overcast skies prevailed throughout the cruize, and the distances were only determined by the means of the runs up and down, as shown by Massey's patent log.† The breadth of the river at Wu-chu is about 3 cables between the sandbanks, and nearly a mile from shore to shore.

The Si kiang is moderately deep from Shao-king to Wu-chu, having generally from 3 to 5 fathoms water in the channels for nearly 60 miles

* Cruize of the *Whampoa*, November 1862.

† The 75 miles of river from Shao-king to Wu-chu were accomplished in 3½ days of 12 hours a day; this gives an average of 21½ miles a day, or 1¾ miles an hour. The average speed of the gun vessels (40 H.P.) being about 4 knots, 92 miles of running were required to complete the 75, showing an adverse current of 17 knots. The return passage was made in 20 hours, the log showing 61 miles, *i.e.* 45 miles per day, or 3¾ miles per hour.

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above Shao-king; in a gorge in Yuet-shing reach a depth of 29 fathoms was obtained. The navigation becomes difficult as Wu-chu is approached. For the last 4 miles it is most intricate, and barely 7 feet was found between the rocky ledges. The *Woodcock* grounded twice on rocks, and the *Watchful* on a bank of hard sand a few miles below the city. There are numerous villages along the river banks, and a military station at every 3 miles. The walled town of Fong-chuen, and the walled city of Tak-hing stand on the left bank, the former 12 miles, the latter 55 miles, below Wu-chu.

TIDES and CURRENT.—The level of the Si kiang at this season (February) at Wu-chu, was from 25 to 30 feet below the river banks; probably 25 feet below the summer level in July and August. The velocity of the stream never exceeded 2½ or 3 knots. The river, however, seems to have been from 2 to 4 feet deeper in its higher parts in November. There was a rise and fall of 18 inches at spring tides. The stream never turned, but was checked during the flood.

WU-CHU to TENGHIEN.*—About 3 miles above Wu-chu is a long and highly cultivated island dividing the river into two broad channels. The island is several† miles in length, and not far above its upper extremity we got sight of the first rapids. Seen from a little distance there appears to be a line of pyramidal rocks stretching across the river. On a nearer view, however, these pyramids are seen to be piles of large stones built upon the rocks, and serve as beacons to mark the various channels, and to point out the dangers in the way of navigation. The current is strong, but by no means excessive in November, and there was a good depth of water between the rocks. The distance from these to the second row of reefs is about 2 miles, and then a succession of reefs and rapids for more than a mile, the current being stronger and the channel more intricate than at the first barrier. Ahead, the river contracted greatly in breadth, and the passage seemed completely blocked up by a mountain barrier. Jagged basaltic rocks jutted out of the water in every direction. On the right bank rose a perpendicular cliff, topped by a fine crag about 1,500 feet high; on the left a fine range of mountains, culminating in a three peaked summit estimated at 2,500 feet. This was named mount Triceps. Several large passenger and cargo boats were in company, showing that there are no real obstructions to navigation even in this apparently intricate portion of the river.

Clearing the Yung-tam-shan pass, the river, making a grand sweep to the north-west, widens into a breadth of 1½ miles, with several islands in

* Notes of an excursion up the West river by the Rev. J. J. Irwin, November 1861.

† Three miles by Du Halde's map.

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the middle, and reefs in some places forming almost a dyke across the stream. At this part the absence of inhabitants and of all traces of cultivation were very striking. The river now expanded into a sheet of water resembling a large oval lake with wooded shores, below Yan-whoa. Above this market town is Tenghien, 25 miles from Wu-chu, at the confluence of the Pak-lo-wa from the south, on the right bank of which are two pagodas, one of which has the appearance of a church steeple. The city was in ruins, but had been once populous and thriving, with broad and well paved streets.

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CHAPTER III.

EAST COAST OF CHINA.—HONG KONG TO AMOY.

INCLUDING SWATOW AND THE RIVER HAN, AND AMOY HARBOUR.

VARIATION IN 1884.
Hong Kong, 0° 35′ E.; Amoy, 0° 25′ W.

TATHONG CHANNEL, the eastern entrance to Hong Kong harbour, is formed between the east side of Hong Kong island, and the conspicuous island of Tamtu. Tathong point, the east point of entrance, juts out from the main body of Tamtu in the form of a somewhat low rocky peninsula.

Tathong Rock, 6 feet above high water and steep-to, lies in the fairway of this channel, about 1¼ miles W. by S. of Tathong point and 4 cables off two rocky islets on the Hong Kong shore 1¼ miles northward of Tylong head. The rock is dangerous only at night, for the channel between it and Tamtu being a mile broad, it can easily be avoided by closing the Tamtu shore.

BOKHARA ROCKS.—Two dangerous sunken rocks (with 9 fathoms between them) lie at the southern part of the entrance of the Tathong channel.

S.W. rock (on which the S.S. *Bokhara* struck) is a pinnacle rock with 3 fathoms on it at low water, from which Tathong rock bears N. by W. ¼ W., and cape D'Aguilar lighthouse W.S.W.

Buoy.—A black and white chequered buoy has been moored in 9 fathoms close to the western edge of S.W. Bokhara rock, with Tathong rock bearing N. by W. ¼ W., and cape D'Aguilar W.S.W.

N.E. rock is a pinnacle rock with 18 feet water over it, situated about 1½ cables N.N.E. ½ E. from S.W. rock.

From the centre of N.E. rock, Tathong rock is in line with the extreme of cape Collinson, bearing N. by W. ¾ W.; the north-west point of Beaufort island is just shut in behind the rocky islet to the southward of cape

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D'Aguilar, S.W. southerly; and cape D'Aguilar lighthouse bears S.W. by W. $\frac{2}{3}$ W. distant $8\frac{1}{2}$ cables.

DIRECTIONS.—Vessel bound to the southward through Tathong channel, and wishing to pass between Bokhara rocks and Hong Kong island, should, after passing to the eastward of Tathong rock, bring the summit of Beaufort island in line with cape D'Aguilar bearing S.S.W., and steer with that mark on, until Tathong rock is in line with the left extreme of Taitoo island N. $\frac{1}{3}$ W., which mark should be kept on, until abreast of cape D'Aguilar. If passing to the westward of Tathong rock, the latter mark should be brought on as soon as convenient after passing that rock.

Vessels passing to the eastward of Bokhara rocks should not open Tathong rock to the northward of Pottinger peak, until the southern extreme of Tytam peninsula is open south of cape D'Aguilar.

The most direct route for steam vessels leaving Hong Kong by Lyemun pass and through Tathong channel is to pass west of Tathong and Bokhara rocks, and, after passing cape D'Aguilar steer so as to pass midway between Putoy and Sunkong islands, where there is a good channel with 15 to 20 fathoms mud.

If entering Tathong channel from the eastward in thick weather or at night, hug Tathong point, the low, dark headland of Tamtu, and pass it at 2 to 3 cables, on a W.N.W. course, which will lead in well to the northward of Tathong rock. Preserve this course until the west point of Tamtu is abeam, when haul up N.N.W.; but if it be not desirable to proceed into Hong Kong harbour, haul out of the fairway, and anchor over towards either shore, as convenient, in 9 or 10 fathoms. This part of the harbour is of very even depth, and the soundings, except within the line of projecting points will not be found to decrease, so that caution is necessary when approaching the shore.

If bound from Hong Kong southward, or proceeding through the Shingshi-mun pass, after passing eastward of Tathong rock, do not bring it northward of N.N.W.; or keep it well shut in with cape Collinson until Tytam head shows open of cape D'Aguilar. The same directions will serve if entering Tathong channel from the southward.

Lights.—(*See* page 92).

Anchorage.—Vessels having run out from Hong Kong road through the Lyemun pass, and wishing for anchorage, either for the night or in consequence of bad weather, will find a good berth in the bay on the north side of Tamtu in 6 fathoms; but not too close in, for the water shoals to $2\frac{3}{4}$ fathoms at 3 cables' length from the Joss house on the north side of the

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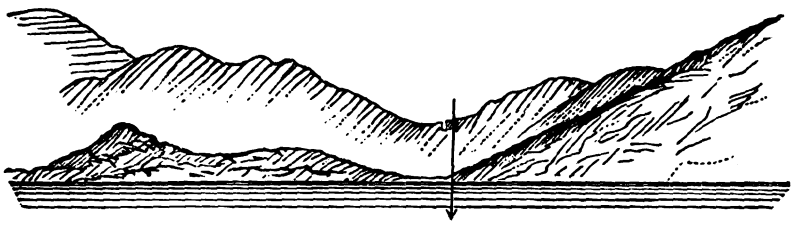
bay.*† There is also secure anchorage to be obtained northward of Junk island in 4 to 5 fathoms (mud).

TAMTU or Tunglung island, 820 feet above the sea and 3 miles in circumference, is separated from the mainland by a channel called Fotowmoon pass, which is only 1¼ cables wide between the rocks which lie off both points, with 3 fathoms water in the channel. S.E. ⅓ E. 4 cables from the north point of Tamtu lies a sunken rock from which the west end of Steep island (the first small islet to the north-eastward) just shows clear of Yih bluff, a remarkable headland, bearing N.N.E. ½ E.

To the southward of the west point of Tamtu there is a flat islet or rock lying a cable's length from the shore, with reefs inside it. Upon the first point outside Fotowmoon pass stands a ruined fort.

Fotowmoon Pass.—If using this passage, *which is very narrow, and only fit for small vessels*, a very remarkable fissure in the high land on the N.E. point of Hong Kong kept a little open to the southward of the low extreme of the promontory, south of Junk Town forms a good leading mark right through the centre of the channel.‡

Fotowmoon Pass.
Leading mark.



STEEP and TRIO ISLETS.—Steep islet is 1¼ miles northward of the eastern entrance of the Fotowmoon pass, and 4 cables from the shore; and 1½ miles farther north are the Trio islets. There is an indentation in the coast, with 8 fathoms water between Trio and Steep, but it is exposed to easterly winds and swell.

NINEPIN GROUP, lies 3 miles eastward of the Fotowmoon pass. The two largest islets are north and south of each other, with a channel between, 2 cables wide. The southern face of the South Ninepin is a

* *See* Admiralty Charts:—Hong Kong, No. 1,466, scale $m = 2{\cdot}4$ inches; Sheet 2, East coast of China, No. 1,962 scale, $m = 0{\cdot}24$ of an inch; and Mirs bay, No. 1,964, scale, $m = 0{\cdot}8$ of an inch. Also, Sheets of Views, Nos. 1,038 and 2,558.

† The Hong Kong Pilots recommend this as a secure typhoon anchorage.—Navigating Lieutenant's Remark book, H.M.S. *Egeria*, 1875.

‡ H.M.S. *Nassau* used this channel on more than one occasion, never getting less than 21 feet at low water spring tides.

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precipitous cliff, 330 feet high; off its south-west side is a smaller islet, and towards its northern point the land becomes lower, with a peaked rock in the offing. The surface of the North Ninepin is nearly of the same elevation, with the exception of a cleft near its northern end; an islet lies off its south-west extreme.

Ninepin rock, or East Ninepin, 222 feet high, is nearly a mile eastward of the North Ninepin, and assumes the appearance that its name indicates only when seen in a N.W. or S.E. direction; otherwise the name is liable to mislead. Close to its north-west side is a smaller islet, and there are detached rocks upon its north-east and west sides.

One-foot rock, lying S. ¾ W., not quite 7 cables from Ninepin rock, has only a foot over it at low water. The marks for it are, the south end of South Ninepin in line with the shoulder of the hill northward of the highest part of Tamtu, W. ⅓ S.; and the right extreme of the rock lying on the north side of the North Ninepin in line with the summit of Shelter island in Shelter bay, N.W. The south end of South Ninepin on with Fotowmoon pass, W. ¾ N., leads south of it.

North rock, lying N.W. ¼ N. 9 cables from Ninepin rock, is nearly awash. There is a reef, which breaks at low water, nearly a cable south-east of it.

TIDES.—It is high water, full and change, at the Ninepin group at 10h. 0m., and the rise is 5 feet. In the channel between the group and Steep islet, at full and change in May 1845, the flood ran S.E., and the ebb S.W., the former 0·3 of a knot and the latter half a knot.

PORT SHELTER.—To the northward of the Ninepin group the mainland forms a deep bay, containing port Shelter and Rocky harbour. The western of the two, port Shelter, runs back 5½ miles to the northward, and its head is separated from the south-west portion of Mirs bay by an isthmus 1½ miles wide, overlooked by the Hunchback hills, 2,315 feet above the sea, which with Sharp peak, 1,540 feet high, on the west side of the entrance to Mirs bay, form conspicuous marks by which this portion of the coast may be recognised.

When steering for port Shelter, pass eastward of Trio and Table islets, as rocks extend 3 cables from the point to the westward of them. Nearly one mile northward of Table islet is the southern point of Jin island, with a Peaked rock 2 cables southward of it; and E. ¾ N. rather more than a cable from Peaked rock, is a rock awash at high water.

Shelter island, one mile north-west of Table islet, should likewise be left to the westward when steering for port Shelter, as the ground is foul between it and the main. There is good anchorage on the north-west

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side of Shelter island, in 8 fathoms, but give the north point of the island a berth of a cable; and avoid the 9-feet patch, lying 6 cables to the northward in the centre of the bay, and from which Table island is on with the north end of North Ninepin, bearing S.E. $\frac{3}{4}$ S.; the opening between Keui and Jin islands nearly East; and Shelter island S. by E. southerly. One cable from the west point of Shelter island is a rock awash at low water; and a patch of $2\frac{3}{4}$ fathoms half a mile westward of it.

Sharp island, lying North $1\frac{1}{3}$ miles from Shelter island, has fair anchorage on its eastern side, but exposed to southerly winds; and from which, passing north of Keui island, is a junk or boat passage leading into Rocky harbour.

ROCKY HARBOUR is formed by Keui and Jin islands on the west, and by High, Basalt, and Bluff islands to the east and south-east. Anchorage will be found in the N.E. monsoon on its eastern side, in the neighbourhood of a small cove northward of Green islet, where there is a mandarin station and a village. Inside the cove the depth is 6 fathoms, but the space is confined, owing to sunken rocks. In the S.W. monsoon vessels will be better sheltered by anchoring to the north-west of Day islet. The southern entrance of the harbour between Bluff and Jin islands is a mile wide; the rock awash at high water off the latter, has been mentioned above. Day islet, lying 2 cables from the eastern shore of Jin, is low and flat.

Three-feet patch.—Midway between Day islet and the north end of Bluff island is a rocky 3 feet patch, from which the west point of Bluff island is on with the summit of North Ninepin, S. $\frac{1}{4}$ E., and the southern summit of Day islet W.N.W. The North Ninepin and Bluff islands, touching, leads westward of it; and the west end of the islet lying off the south-west end of North Ninepin, in one with the west point of Bluff island, leads eastward; also, a vessel will be northward of it when Pyramid rock opens clear of the north-east extreme of Bluff island, S.E. by E. $\frac{3}{4}$ E.

Three-fathoms patch lies 6 cables northward of the 3-feet patch, with the summit of Day islet W.S.W., Pyramid rock S.E. $\frac{1}{4}$ S., and Green islet, the small islet on the eastern shore, E. $\frac{3}{4}$ N., 3 cables.

The channel between Basalt and Bluff islands is 4 cables wide, and has 5 fathoms in it at low water. The former island is 8 cables long, north and south, and 572 feet above the sea; the southern faces of both islands are very precipitous.

The channel between Town and Basalt islands is also 4 cables wide, but it should not be used without a leading wind or in a handy vessel, as the

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chow-chow water,* or whirling eddies, might lead them into difficulty. It is also obstructed by islets and a rock awash at high water; and to the eastward of the 3-feet patch in Rocky harbour, the ground is foul with some casts of 3 fathoms.

High island, 7½ miles in circumference and 910 feet above the sea, is separated from Town island by a channel which though formerly carrying a depth of 3¼ fathoms water, is now (1878) blocked. In some places it is barely a cable wide. At 1½ cables eastward of the latter is Hole island, so called from its being perforated. To the northward of these islands are two low islets. The channel between High island and the main has not more than a foot in some places at low water.

VICTOR ROCK.—This danger, which is about 40 feet long in a N.E. and S.W. direction and 30 feet broad with 3 fathoms over it at low water spring tides and 15 fathoms close around, lies about 3½ miles eastward of Basalt island with the following bearings:—

Fung head - - - -	N. 16° W.
South extreme of Basalt island - -	N. 87° W.
East Ninepin in line with South extreme of South Ninepin - - -	S. 55° W.

It is in the track of vessels proceeding along the coast northward of Hong Kong.†

FUNG BAY.—Conic isle, lying close to the shore, N.N.E. 2¼ miles from Hole island, has immediately westward of it a small bay 3½ cables wide and three-quarters of a mile deep, which might be used in the N.E. monsoon. Fung bay, the next inlet to the northward, is 1¾ miles wide, and has two islets and a rock in the middle of it; but is too much exposed to the eastward to be of any use. Sharp peak, noticed in page 144, overlooks this bay, and bears from Ninepin rock, North, easterly, nearly 10 miles.

MIRS BAY is a deep inlet 15 miles to the north-east of Hong Kong, and its entrance, between Fung head on the west and Mirs point on the east, is 5½ miles wide; its extent northerly is 11 miles, and in an east and west direction 18 miles.‡

Gau-tau, a rocky islet 90 feet high, lies about 2 miles within the entrance, and S.W. by W. about half a mile from it is a rocky ledge, part of which is always uncovered.

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* Chow-chow water is a term applied to those ripplings or eddies occasioned by the meeting of adverse currents, the tide passing over uneven rocky bottom, or round the sharp bend of a river, &c., which are frequently so violent as to render a vessel unmanageable when within their influence.

† These bearings place the rock in latitude 22° 17′ 55″ N. and longitude 114° 26′ 15″ E.

‡ *See* Admiralty plan of Mirs Bay, No. 1,964, scale *m* = 0·8 of an inch.

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South Gau island, 96 feet high, is 1½ miles S.W. by W. of this ledge, and half a mile off shore.

The hills near Mirs point rise to the height of 1,200 feet, and just off its south extreme is Griffin rock. To the eastward of the islet are some rocks, a cable from the shore; the firs point to the northward of them is perforated.

GRASS ISLAND.—The point on the west side of entrance of Mirs bay, 1¼ miles N. by W. of Fung head, has two islets off it, and from thence the coast of the bay trends suddenly to the westward, then northerly 1½ miles, where an opening 3 cables wide leads into Long harbour; the navigable channel however has only 2 fathoms in it, and is barely a cable wide, with shoal water extending from both shores.

On the north side of the opening lies Grass Island, 420 feet high; and 3½ cables eastward of this island is North Gau, a large black rock, with a reef, awash at high water, lying N.W. ¼ N. 4 cables from it.

ROCK.—A rock on which the German ship of war *Cyclop* recently grounded has been found to lie in the passage between Grass island and North Gau islet; it is situated about a cable to the westward of the islet which lies near the west side of North Gau, and where a depth of 9 fathoms was formerly marked on the chart. The rock has a depth of 6 feet, and consists of three heads rising steeply from the bottom within an area of 20 square yards; there is a depth of 7 fathoms within a short distance of the rock.

Much caution is required in navigating the channel between Grass island and North Gau. The "*Cyclop*" had, previons to grounding, twice passed through the channel and found no less than 3½ fathoms water.

PORT ISLAND, 420 feet high, is nearly 6 cables northward of Grass island, and its north-east point, which is narrow, projects 3 cables from the body of the island.

Water.—There is a convenient watering-place on the northern side of this island.

LONG HARBOUR, runs in, 3½ miles in a southerly direction from its entrance (6 cables wide); which is a mile S.S.W. of Port island. Both shores are steep-to, with the exception of the south-west end of Grass sland, where there is a cove with a rock off its north point; to the northward of this rock, and half a cable from the shore, is a rocky patch of 3¼ fathoms; some rocks also, which show at low tide, extend nearly a cable from high water mark at the south-west end of the island. Southward of Grass island, the harbour widens to 1¼ miles, and then gradually decreases towards its head, where it is separated into two coves, half a mile from the head of which the depth is 4 fathoms.

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JONES COVE, the next inlet westward of Long harbour, is a mile deep N.N.E. and S.S.W., and 3 cables wide; but it, as well as Long harbour, is open to a considerable swell from the N.N.E.

On the western side of the cove are three islets, and 2 cables northward of Flat islet, the largest, are two rocks awash at high water, from which the summit of Port island bears N.E. $\frac{3}{4}$ E., and the north end of Grass island E. $\frac{2}{3}$ N.

TOLO CHANNEL, leading into Tolo harbour, is the next inlet westward of Jones cove. Its entrance, between Port island and Bluff head, is nearly $1\frac{1}{4}$ miles wide; thence the channel trends S.W. by W. 7 miles to White head, forming a Sound not less than 7 cables wide, with shores steep-to, the depth varying from 6 to 14 fathoms on the north shore; 2 miles within Bluff head, on the north shore, is a small cove.

Within the channel $3\frac{3}{4}$ miles from Bluff head is Knob reef, with a flat reef 2 cables S.W. of it; and 2 miles farther in lies Bush reef, north of which, $3\frac{1}{2}$ cables, is Harbour island. The main land to the southward is nearly a mile distant from this latter reef, but the 3-fathoms line extends 4 cables from its shore. Although there is a navigable channel on either side of these reefs, the one northward is preferred, being the wider, and having 7 to 10 fathoms water. Abreast Knob reef, on the northern shore, is a large cove.

At White head (which is a peninsula with the Hunchback hills, 2,315 feet high, with very precipitous face, rising immediately behind it,) the Tolo channel separates into three arms, Tide cove to the south-west, Tolo harbour to the north-west, and Plover cove to the north-east. Tide cove is $3\frac{1}{2}$ miles deep, and the water shoals gradually from 5 fathoms to its head, whence there is a footpath to Kowloon village, the distance across from water to water being $2\frac{1}{4}$ miles, and the greatest elevation to surmount 920 feet. In the middle of the cove, 2 miles within White head, is a reef which covers at high water, and from which a remarkable waterfall on the western shore bears S.W. by W. $\frac{1}{2}$ W. Tolo harbour is also $3\frac{1}{2}$ miles deep, and has in its entrance Centre isle; and on the north shore are some islands, with anchorage between them and the main. Plover cove would in all probability be found the most eligible place to ride out a typhoon; it runs back $2\frac{1}{4}$ miles to the eastward beyond Harbour island, and carries a depth of 6 to 4 fathoms.

ROUND, CROOKED, CRESCENT, and DOUBLE ISLANDS.—N.W. by N. $2\frac{3}{4}$ miles from Port island, is Round islet, the easternmost of an extensive group lying in the north-west part of Mirs bay; the largest of the group are Double, Crescent, and Crooked islands. Double island, the southernmost, lies N.W. 6 cables from Bluff head, and

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the channel which separates its south-west point from the main is only large enough for boats. The passage between it and Crescent is a cable wide, and has 4 to 7 fathoms water; between Crescent and Crooked, the narrowest part of the channel is 2 cables wide, and the depths 10 and 12 fathoms.

On the north-west side of Crooked island is a large village, and on the east end a remarkable peaked head, between which and the main land, to the northward, the depths are 9 to 4 fathoms, muddy bottom. On the west side of the island is Crooked harbour, a good anchorage; and to the south-ward, formed by Crescent and Double islands, Double Haven, a secure basin, the northern entrance into which is 3 cables wide: within it the depth is 7 fathoms.

PENG-CHAU ISLAND, 3 miles in circumference and 148 fee high, is in the north-east corner of Mirs bay, N. ¼ E. 4½ miles from Gau-tau. The geological formation of this island is totally different from the adjacent land, being alluvial, shale stones forming its beaches. The distance between it and the main land to the eastward is rather more than a mile, forming a convenient anchorage sheltered from all winds. E.N.E. from the island is East Cone, a remarkable peak, 750 feet high, overlooking Typung bay, the distance across being 1¼ miles, and the land but little elevated. Under the peak is Namoa village, and in the bay south of it, a peaked rock and a sunken reef.

ANCHORAGE.—The north-west part of Mirs bay, northward of Crooked island, gradually shoals to the westward, and affords good anchorage. The northern shores of the bay are steep-to. Anchorage in the N.E. monsoon will be found all along the eastern shore of the bay to the southward of Peng-chau; but the number of fishing platforms on stakes in 8 and 9 fathoms water render the navigation awkward in the dark. There is anchorage in south-west winds to the westward of South Gau island, in 8 or 9 fathoms, also in the bay north of Mirs point.

TIDES.—In Tide cove, at the south-west part of Mirs bay, it is high water, full and change, at 10h. 0m., springs rise about 6½ feet; but during neaps the water remains nearly at the same level.

Off Mirs point in April, two days after change of moon, the ebb made E. by N., the greatest velocity being 0·3 of a knot. With the flood there is a *great indraught* into Mirs bay and Rocky harbour, which must be guarded against in shaping a course from the Tuni-ang group to pass outside the Ninepin group.

On full and change in May, the flood inside the Ninepin group ran S.E., and the ebb S.W., the former 0·3 of a knot, the latter half a knot. In March, the moon being 19 days old, the ebb ran to the S.W. 2 knots, or 9 miles in the whole tide.

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DIRECTIONS.—As the ebb stream runs to the southward along the western shore at entrance of Mirs bay, a vessel working to windward with a S.W. wind, will get to the westward speedily by keeping near the land, passing between the Ninepin group and Tamtu; but as soon as the Lema channel opens out she will meet with a strong set to the eastward.

During August and part of September, if a vessel is eastward of the Lema islands, she will find it difficult to proceed along shore to the westward if the wind is from that quarter; she ought therefore either to stand off to the southward for two or three days, if near full and change of moon, when bad weather may be apprehended, or anchor in Mirs or Harlem bay for an easterly wind, which in these months usually happens every few days, close in with the coast.

During the adverse monsoon it is advantageous for steamers of small power, bound northward from Hong Kong, after passing Hole island to steer well in for Fung Head and thence to Mirs point.*

TUNI-ANG GROUP.—From Mirs point, the south coast of the peninsula separating Mirs and Bias bays trends N.E. by E. 8 miles to Teyih point; and between are two sandy bays, off the westernmost of which, 4 cables from the shore, is Coast (or Coin) islet, having 4 fathoms water between it and the land. Six miles eastward of Mirs point, fronting this peninsula, is the Tuni-ang (or Tooniang) group, consisting of eight islets, including Single island and Acong rock.

Tuni-ang, the northernmost and largest islet, is 5 miles in circumference, and its summit rises like a cone to the height of 960 feet; off its western end are two islets; Net island, the nearest, is sugar-loaf shaped, and at low tide there is but a foot water between it and Tuni-ang.

Peak Rock, about 80 feet high lying a quarter of a mile westward of Net island, with 4 and 5 fathoms water between, appears like two islets with a shingle beach connecting them. N.W. ¼ W., 4 cables from Peak rock, is a ledge of rocks, the northern edge of which is always visible; and between them is a reef which breaks at low water.

There are good channels between Tuni-ang and Net islands, and also Peak and Net islands; with smooth water during the N.E. monsoon.

Immediately southward of Tuni-ang island are three islets, called by the Chinese Samun (or three passages), which form a good harbour, named *Samun road*, sheltered from all winds, except those from W.N.W., westward to S.W. by S.

* Fair anchorage will be found north of Mirs point in 7 fathoms with the point bearing S.E. H.M.S. *Nassau* found a heavy swell from the E.N.E. between Hole island and Mirs point in February 1878.—Remarks of Capt. Napier, R.N.

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Samun, the southern islet, is 3 miles in circumference, and distant one mile from Tuni-ang; the channel between it and Cone islet to the northward is not quite 2 cables wide, with 9 and 10 fathoms water. The passage between Cone and Tuni-ang is the same breadth, but crooked, and has but 2½ fathoms water.

Single Island, 200 feet high, is even-topped, and lies S.S.E. 1¾ miles from Samun island.

Acong is a remarkable pyramid rock lying 6 cables N.E. of Single island, with 15 fathoms water between them. N.N.E. ¾ E. about a mile from Acong, is a rock with 16 feet over it, on which bearing it is on with the south-east point of Single island. When on this rock, which rises so abruptly that there was great difficulty in finding it, Cone islet bore N.W. by W. ¾ W., and was in line with a remarkable gap in Tuni-ang.

ANCHORAGE.—In the N.E. monsoon the trading junks anchor in 9 fathoms southward of Net island and Peaked rock, and abreast a fort on Tuni-ang; but the ground is foul within 2 cables of the fort point. The *best* anchorage is in Samun road off the south-west point of Cone islet in 7 and 8 fathoms. During the prevalence of south-westerly winds there is anchorage, in 9 and 10 fathoms, abreast a bay on the north-east side of Tuni-ang.

MIDDLE ROCKS.—N.E. ⅓ E. from the summit of Tuni-ang is the Middle rock, just awash at high water. From it Acong rock bears S. ¾ W.; Bate island, off the east point of Bias bay, N.N.E.; and Lokaup island N.W. by N. 4 miles. Three cables south-west of this rock is a reef which breaks only at low water, and from which the east end of Cake islet (on east side of Lokaup) is in line with the Pillars, N. by W. ¾ W.

The channel between Tuni-ang island and Teyih point, the west point of entrance to Bias bay, is 1½ miles wide; both shores are steep-to, with the exception of the reef already mentioned, lying off Peak rock near the north-west point of Tuni-ang, and a rocky ledge extending south-westerly from the first point East of a remarkable white rock on the north shore. The hills on this side attain an elevation of 2,600 and 2,800 feet.

Steamers of small power bound northward in the autumn months will derive advantage by passing inside (northward) of Middle rocks. Indeed, by following generally the indents of the coast, smoother water will generally be experienced.

BIAS BAY,* a capacious and deep inlet similar to Mirs bay, has a

* The central part of the bay is often thickly studded with strong fishing stakes connected with stout rope gear, which form a serious obstacle to navigation by night. As they are placed in a depth of not less than 6 fathoms, a clear passage is found on the east side of the bay.

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chain of islands fronting its western shore, which is indented by two large bays, at the head of the principal of which is Typung harbour.

Typung harbour, so named from the walled town of Typung on its northern shore, although contracted is capable of affording good shelter for moderate-sized vessels, except with easterly winds, when the anchorage under Lokaup island should be preferred. On the northern side of the harbour is a smooth conical hill, off which a shoal commences extending half a mile from the shore; the southern side, which is bold-to, must therefore be kept aboard. Vessels drawing more than 15 feet should not proceed farther westward than the third point on the south side, as the bottom of the harbour is shoal.

Dumbell bay, the next inlet northward of Typung harbour, runs back westerly 6 miles from Big island, and carries a general depth of about 3 fathoms.

Fan-lo-kong harbour,* in the north-eastern part of Bias bay, has an entrance 1½ miles wide, with a depth in mid-channel of 4 fathoms. At 4 miles north-east of Tsang-chau island the soundings decrease to 3 fathoms, and thence shoal water extends 2 miles farther to the head of the harbour. The village of Fan-lo-kong is on the northern shore. This will probably be found the best anchorage in Bias bay in a typhoon.

Pagoda island, laying 3 cables from the northern shore of the bay, with a depth of 9 feet inside of it, bears from Tsang-chau N.W. by W. ¾ W. 4 miles, the soundings varying from 4¾ to 2¼ fathoms between them. The water shoals towards Pagoda island, and W.S.W. 3 cables of it are some rocks.

LOKAUP ISLAND, the southern of the chain of islands in Bias bay, has off its south end some pyramidal rocks. It bears N. by E. 6 miles from Tuni-ang, and the channel between it and the west entrance point of the bay is 3 miles wide, with a depth of 9 fathoms. The island is about 2 miles long, and nearly separated in two places; the highest part, 330 feet above the sea, is near the south end. There is anchorage on either side of it, according to the prevailing winds.

There are six islets around Lokaup, three on the west, two on the north, and one on the east side. The north islet, the Pillars, is remarkable from the two square pillars on its south side; there is a reef off the west end of the islet south of the Pillars.

MIDDLE GROUP.—About a mile northward of the Pillars is Middle group, consisting of six islets. Green island, 254 feet high, the

* Fan-lo-kong is a good typhoon anchorage. H.M.S. *Nassau* anchored in 23 feet, mud, in February 1878, with Tsang-Chow islet bearing S. by W., 1 mile.—Remarks of Captain Napier, R.N., H.M.S. *Nassau*.

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southernmost, has an islet off its west end; and at three-quarters of a mile northward of it is Reef islet, to the S.E. of which is a reef that breaks at low water; the centre of this reef bears N. by E. ⅔ E. from Green island, and S.S.E. ¾ E. from the summit of Reef islet. There is also another rock, awash at low water, lying North 3 cables from Reef islet, and W. ⅔ N. from the summit of Red islet; and there is another N. ⅓ W. 1¼ miles from Reef islet, and N.W. ½ N. from Red islet.

HARBOUR GROUP, consisting of nine islets, is not quite a mile northward of Middle group. The southernmost are two small islets, the Twins,* to the N.E. of which, at 2 cables is Shoal island, having rocky ground extending north-westerly 3 cables from it, on some parts of which are only 3 feet water. At a quarter of a mile westward of the Twins is Tree-a-top islet, and westward of it, half a mile, is a Sugar Loaf shaped island. Shoal island is separated from Narrow island by a channel 3½ cables wide; should it be used, the shore of the latter must be kept aboard to avoid the shoal just mentioned. Narrow island is three-quarters of a mile long, north and south, and 2 cables wide. Round island lies rather more than 2 cables northward of Narrow island, with a depth of 5 and 6 fathoms between them; to the northward of it 2 cables lies a flat rock nearly awash and steep-to. N. by W. 6 cables from Round island is Cone islet, a conical rock surrounded by reefs; vessels wishing to anchor to the westward of Narrow island will find this channel, or that between Tree-a-top islet and Sugar Loaf island, the best to enter by.

Big island.—To the westward of Sugar Loaf is Big island, off the north face of which is a small islet, and further north a flat rock, with a reef, which shows only at low water; when upon this reef the highest part of Narrow island bears S.E. by E., and Nobby reef N.E. by E. To the N.W. of Big island, 4 cables, is Sand patch, a low rock surrounded by sand; between it and the island are 3½ fathoms water. There is also a rock awash at high water on the south side of Big island.

The passage to the westward, between Big island and the main, is three-quarters of a mile wide, but a reef lies nearly in mid-channel and only shows at half tide; it bears W. by S. ¼ S. from Sugar Loaf, and N.W. by N. from Green island.

BIAS POINT, the east entrance point of Bias bay, is fronted by rocks to nearly a mile, between which and the land the channel is unsafe, but the passage between them and the rock lying off the south-east end of Bate island may be used, being 8 cables wide, with a depth inside of 4½ and 5 fathoms.

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* West Twin has two trees on its summit.

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Bate island is 8 cables long, north and south, and half a mile wide; besides the rock off its south-east end, there is another *rock*, awash at high water, lying N.N.E. 6 cables from its north end, with the south point of Lokaup S.W. by W. ½ W., and the rock off the south-east end of Bate island S. by E.

Triple island.—From Bias point the eastern coast of the bay trends northerly 8½ miles to Tsang-chau island. There is anchorage in the N.E. monsoon between Bate and Triple island, lying 2¼ miles to the northward. The channel between Triple and the main is 6 cables wide, with a depth of 3 fathoms; but a cable eastward of the island is a small rock nearly awash.

Tsang-chau is a low flat islet with a smaller one S.E. of it, lying 6 miles northward of Triple. The passage between it and the main land is a mile wide, with 2 fathoms water; but rocks extend off both shores.

MENDOZA ISLAND, 480 feet high, and 2¾ miles in circumference, bears S.E. by E. ¼ E. 7½ miles from Bate island, and a vessel will find shelter from a S.W wind on its northern side. Off its western side is a small islet separated by a channel a cable wide, and of 9 feet water.

Tsincoe island, 167 feet high, lies 6 cables northward of Mendoza, with 11 fathoms water between; near its centre is a remarkable cleft.

FOKAI POINT, N.E. by E., 3¾ miles from Mendoza, is the south extreme of a promontory connected to the main by a low sandy isthmus; the land near the point is high, and has the appearance of an island when viewed eastward or westward. On the summit of the Fokai hills is an artificial mound 670 feet above the sea, and on the hill over the south-west point is a large fort. On the east side of the isthmus are three rocky islets; and E. by N. 8 cables from the northernmost islet, is a reef showing at low water, from which the east extreme of Fokai point bears S. by W. ½ W., and the Pauk Piah rock E.S.E.

HARLEM BAY,* formed on the west side of Fokai promontory, affords secure anchorage in the N.E. monsoon; but it cannot be considered safe during a typhoon, when the winds are liable to shift suddenly to different points of the compass. A good berth will be found northward of Hebe islet in any convenient depth of water.

Hebe islet, 70 feet high, is flat-topped, and a ledge of rocks, which covers at high water, extends 3 cables north-eastward of it.

S.W. by W. 3 cables from Hebe islet lies a rocky 3½ fathoms patch, bearing North from Middle rock, and N.W. ⅓ N. from the west extreme of Fokai point.†

* The natives here are not so shy of intercourse as at other places along the coast; they will supply fish and vegetables.

† Mr. Henry F. Woods, R.N., Master of H.M.S. *Cormorant*, found the depth at 4 cables west of Middle rock to be only 5 fathoms, where in 1812 was 10 fathoms.

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Middle rock,* 10 or 12 feet above the sea, lies 6 cables westward of the west extreme of Fokai point, which may be passed on either side.

On the western foot of the Fokai hills is a fort, with a tall chimney on the hill behind it: north of the fort is a creek, which extends northerly along the sandy isthmus, and into which junks run at high water.†

TIDES.—It is high water, full and change, at Tuni-ang island (page 150) at 8h. 0m.; at Tsang-chau in Bias bay at 8h. 30m.; and at Hebe islet in Harlem bay (two days before full moon) at 10h. 0m. In the month of April the current in this neighbourhood set constantly to the westward its rate increasing upon the flood, but did not exceed a knot. When, however, the monsoon drift-current recedes from the coast, the tidal influences prevail, and it is commonly reported that the flood stream sets westward and ebb eastward, or directly the reverse of their set north of Breaker point, *see* p. 166.‡

DIRECTIONS.—Bound to Bias bay from the eastward, pass about a mile westward of Mendoza island, and then steer N.W. by W. for the opening between Lokaup and Bate islands, the water shoaling from 13 to 10 fathoms over muddy bottom. With a turning wind, when standing westward, do not bring Bate island eastward of N. ¼ E., nor Acong rock southward of S. by W. ½ W., until Tsincoe island bears southward of East, to avoid the Middle rocks. Thence either proceed up the bay to an anchorage in 5 fathoms, about 1½ miles from the eastern shore, 3 miles northward of Triple island; or to the southward of Lokaup to an anchorage in the bay, or in Typung harbour. There are several populous villages on the eastern shore where no doubt refreshments could be obtained.

If bound to Harlem bay, round Fokai point about half a mile off in 13 fathoms water, and either haul up between the shore and Middle rock, or pass between that rock and Tsincoe island. If the wind be easterly, it will perhaps be better, if the vessel is of moderate draught, to adopt the former channel, as she will fetch the anchorage without tacking, taking care to avoid the 3½-fathoms patch south-west of Hebe islet; but a large ship should pass westward of Middle rock, although she should have to tack, she will then be far enough from the high land to avoid the variable flaws of wind, and the disagreeable consequences that might arise from being baffled in a narrow channel.

SAM-CHAU INLET.—From Fokai point the coast trends N.E. by N. 12 miles to Ross head, and at the distance of 9 miles is Coast islet,

* This must not be confused with Middle *rocks*, mentioned at page 151.

† The Chimney is situated on the point which bears N.E. ¼ E. from Hebe islet. Captain Napier, R.N.

‡ Flood tide was found to be setting to the E.N.E. off Fokai point in February 1878. *Ibid.*

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lying 4 cables off shore. Shoal water, over rocky bottom, extends 6 cables southward of this islet, and here, close to a flat rocky head, is an opening a cable wide into the extensive inlet of Sam-chau, the channel, carrying 5 and 6 fathoms, being close to a narrow cliff on the southern shore; but in strong easterly winds the sea breaks across it. The entrance bears W. by N. ½ N. from Si-ting islet, and E. ½ N. from Harlem peak, which, being 2,070 feet above the sea, forms a conspicuous landmark. S.S.W. ¼ W. nearly 2½ miles from Coast islet is a sunken rock, from which Si-ting bears East nearly six miles, and Harlem peak N.W. ½ W.

Commander P. Cracroft, of H.M.S. *Reynard*, who visited this inlet in chase of pirates, says, "The mouth of the inlet is but little wider than the breadth of a ship; there is also an inner bar with an equally narrow passage; and across both these bars the tide runs 5 knots. The depth in the channel varies from 6 to 8 fathoms, and deepens to 10 fathoms above the upper bar, where there is ample room for a vessel to swing; but such is the intricacy of the navigation that a personal examination should be made, and the state of the tide carefully ascertained before attempting the entrance."

PEDRO BLANCO ROCK,* (Ty-sing-cham of the Chinese,) in lat. 22° 18½′ N., long. 115° 7′ E., is about 130 feet high, and when bearing North appears as two rocks; the summit is of a white colour. It is bold to approach, having 20 fathoms close to the southward, and 18 fathoms to the northward, decreasing gradually to 13 fathoms in the neighbourhood of the Pauk Piah rock, which bears from it N.N.W., distant 15 miles.

PAUK PIAH and WHALE ROCKS.—The Pauk Piah is a flat rock, from 20 to 24 feet above high water, from which the summit of the Fokai hill bears W. ½ N. 7 miles.

S. by W. 2½ miles from the Pauk Piah are the two Whale rocks, rising abruptly from the depth of 12 fathoms, and upon which the sea sometimes breaks. From them, the west extreme of Fokai point is on with the summit of Bate island, W. by N. ⅓ N., the summit of Fokai bears N.W. by W. ½ W. 7 miles, and the summit of Mendoza, West, a little northerly.

TUNG-TING and SI-TING are two rocky islets about 50 feet above the sea, lying S.E. ½ S. and N.W. ½ N. from each other, 1½ miles apart; around both are sunken and detached rocks, and the depth of water in their vicinity is 9 fathoms. From Si-ting the Fokai hills bear S.W. by W. ½ W. 11 miles, and the Pauk Piah S.S.W. ¼ W. 6¾ miles.

Sunk and Single rocks.—N.W. by W. 1½ miles from Si-ting is Sunk rock which often breaks. Hat islet bears from it N.E. ¼ E., and

* Light proposed.

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Harlem peak W. $\frac{2}{3}$ N. Mace point, open North of Hat islet, bearing about N.E. $\frac{3}{4}$ E., leads to the northward. There is also Single rock, which breaks only at low water or when there is a heavy sea, and from which Si-ting bears S.W. by W. $\frac{1}{2}$ W.; Tung-ting S.W. by S.; Hat islet N. by E. $\frac{1}{4}$ E.; and Harlem peak, West, northerly.

HONG-HAI BAY,* about 15 miles north-east of Fokai point, is extensive, but in the upper part the water shoals to 3 and 4 fathoms, and is open to S.W. and South winds. There are several islands in the bay, the largest of which, Hong-haï, is in the middle of it.

Vessels are recommended not to pass westward of Tung-ting and Si-ting, nor into the north-west part of this bay, as they will find a heavier sea there than outside; there is also usually a long ground swell near Inside island, rendering it advisable not to stand farther in than Hong-haï island.

INLET.—In Hong-hai bay is an inlet, not identified, but probably that which is 9 miles north-east of Fokai point, which was visited by Captain P. Cracroft, R.N., H.M.S. *Reynard* in 1849. Its bar extends nearly across the entrance, leaving an opening, on the south side, of very little more than a ship's breadth. There is an inner bar also on the south side, with an equally narrow passage, hugging a point which resembles "Devil point," at the entrance of Hamoaze; and over these bars the tide sets, at springs, with the great velocity of 5 or 6 knots.

The depths in the channel vary from 4 to 8 fathoms, deepening to 10 fathoms above the inner bar, where there is ample room for a ship to swing, but the navigation is so intricate that a careful examination should be made before attempting the entrance, and the state of tide correctly ascertained.

Hong-haï island, bearing N.E. $\frac{1}{3}$ E. 8 miles from Si-ting, is half a mile long, east and west, 3 cables wide, 240 feet high, and has shelter on its northern side from southerly winds. Two rocks, visible at low water, lie 3 cables from the shore, S. by E. $\frac{3}{4}$ E. from its summit, with its south-west point bearing N.W. by W. $\frac{3}{4}$ W., and in line with the south end of Inside island; and its east point N. by W. westerly, and in line with the highest part of Mace point.

Hat islet is a peaked rock $2\frac{1}{4}$ miles westward of Hong-haï. It is called by the Chinese Ke-sin-she (fowl's heart), which it more resembles than a hat; there are detached rocks about it.

Inside island, 5 miles N.W. of Hong-haï is 460 feet high, a mile long north and south, and but little more than a cable wide. Three cables

* Care is required when passing the vicinity of this bay at night, as it is in fine weather usually crowded with fishing junks; no less than 232 having been counted at one time.—Captain Napier, R.N.

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off its south-west end are some detached rocks; and in the bays east and west of it not more than 2½ fathoms will be found at low tide. West, 3 miles from the island, is the embouchure of a large stream, but with only 6 feet over the bar at low water.

SHOAL BAY is formed at the head of Hong-haï bay, 3 miles N.N.E. of Hong-haï island. Its entrance is 2 miles wide, and within the water shoals to less than 3 fathoms. In its north-east part is an inlet, with only 6 feet over the bar at low water, which communicates with Hie-che-chin bay; by report it is navigable for small boats only.

Three-quarters of a mile eastward of Club point, the east point of entrance to Shoal bay, is a rocky ledge, part of which is always above water.

TY-SAMI INLET, bearing E. ¾ N. 9 miles from Hong-haï island, has an entrance channel half a mile wide, with 2½ fathoms in it at low water. The northern shore of the channel is shoal-to, and rather more than half a mile off the beach are some rocks, which show at low tide, and from which Ty-sami mound bears S.S.E., and the low conical hill at the back of the town E. by N. ¼ N. Ty-sami mound, 970 feet above the sea, is an artificial cone on the highest part of the hills near the eastern point of Hong-haï bay.*

The southern edge of the channel is bordered by a sandbank, which commences under Ty-sami mound, and extends 1¼ miles off shore, until its north end bears West from Entrance head, where it shoals suddenly to 3 feet on its edge. The north end of the sandy spit under Entrance hill (on the south side of the entrance), in line with the conical hill at the back of the town bearing E. ⅔ N., will lead into the inlet, rather on the south side of the channel.

Fair anchorage may be found westward of Ty-sami head, with good shelter in the north-east monsoon; but a long heavy swell rolls in.

TIDES.—In Hong-haï bay it is high water, full and change, at 10h. 0m., rise 6½ feet.

GOAT ISLAND,† lying S.E. 3 miles from Tsiech point, the eastern outer entrance point of Hong-haï bay, is the southernmost and largest of a numerous group, amongst which there are no navigable channels. S.W. ½ W. from its summit, and S.S.E. ½ E. from Ty-sami mound, is a dangerous rock, which shows only when the tide is low and the wind high. At rather more than a mile inland from the beach northward of Goat island, is the walled town of Tsieching.

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* *See* Admiralty Plan of Ty-sami inlet, scale $m = 1$ inch on Sheet 2 East Coast of China.

† About 175 feet high.—Capt. Napier, R.N.

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ANCHORAGE.*—There is good anchorage in the N.E. monsoon on the north-west side of Goat island, which, with the group of islets northward of it, shelters as well as can be expected from the heavy sea. This roadstead is very convenient and was always much used by opium vessels, which approached as close to the shelving beach as the depth of water allowed.

REEF ISLETS lie S.E. by E. 3 miles from Goat island. The southern and largest islet (which is from 35 to 40 feet high) has reefs extending a cable in a southerly direction from its east end. In using the channel between Goat island and these islets, take care to avoid a sunken rock on which the sea breaks at low water, bearing E. ¼ N. 1⅓ miles from the summit of the island, and N.W. ¾ W. 2 miles from the north end of the islets.

Vessels may pass between Reef islets and Middle reef (awash), lying 1¾ miles to the northward, the depth being 7 and 8 fathoms; but bear in mind that reefs extend rather more than 2 cables northward from the islets, the northern danger bearing W. ½ S. from Chelang point. *It will not be prudent to pass in shore of Middle reef.*

CHELANG POINT, 5 miles E. by N. ¼ N. from Reef islets, is very remarkable, of moderate height, composed of red sand,† with many ragged rocks scattered over it. The point has two islets and a reef close off it, and the depth is 13 fathoms within a mile of the outer islet, which is 80 feet high.

On the western extremity of this headland, is a fort, and westward of the fort a small bay, which affords indifferent shelter in the N.E. monsoon; but a sunken rock, with only a foot water over it, lies N.W. by W. 5½ cables from the fort, with the summit of Chelang point in line with the southern rock off the fort point S.E. ⅜ E., and Flat rock S.W. ⅓ W.

Flat rock, which is 10 feet high, is 1¾ miles W. by N. from Chelang point, and a small sunken rock lies N.W. of it, and West from the fort. The land on either side of Chelang point for some distance is of a remarkable red colour with black mounds.

KIN-YU or Kemsue is a rocky islet, half a mile long N.E. and S.W., lying N.E. ½ N. 3¾ miles from Chelang point, and under its highest or north-east part is a high rock. Its shores are bold-to, but the islet is too small to afford shelter. The channel between it and Che-chin point is 1½ miles wide, and carries depths of 7 and 8 fathoms; but off the point is a large white rock surrounded by reefs.

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* *See* enlarged Admiralty plan on Sheet II, East Coast of China.

† The red sand is very remarkable from a distance.—Sub-Lieut. Jackson, H.M.S. *Sheldrake*, 1877.

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HIE-CHE-CHIN BAY, formed between Paukshao point on the west, and Tongmi point on the east, has 7 to 5½ fathoms water at entrance, shoaling to 3 or 3½ fathoms within a mile of its head, over soft muddy bottom. It affords shelter from westerly and northerly winds, and from the N.E. monsoon, but is quite exposed to the southward and south-east. At the head of the bay, the land is low with a sandy beach; the eastern side of the bay is high and mountainous. The village of Kinsiang stands in the north-east bight of the bay, immediately under Round hill; to the northward of Kinsiang point are not more than 3 fathoms at low tide. Two rivers empty themselves at the head of the bay, with bars of less than 9 feet water, and the sea usually breaks across them; the western river communicates with Hong-haï bay, and affords a passage for boats and small junks.

Near Tongmi point is Chino peak, a remarkable conical hill, 455 feet high, which, with the islets of Tung-ki and Si-ki, render this side of the bay easy to recognise when well within it. But when in the offing some have, in approaching Chino bay, mistaken at first for Chino peak, Round hill on the northern shore of the bay, which is also a remarkable conical hill, 1,456 feet high. When first seen Round hill rises like an island, and is a good mark when approaching from the south-westward. The land about Chino bay, when first made from the same direction, appears of a somewhat uniform height.

Tung-ki.—Chino peak bears N.W. ¾ N. nearly 2¼ miles from Tung-ki, which is 18 feet above the sea, having some detached rocks on its eastern side, and three rocks awash at low water, half a cable from its north-west side.

Suwonada rock, upon which a steamer of that name struck, August 1869, lies in nearly mid-channel between Tongmi point and the Tung-ki rocks. It consists of two or three pinnacle rocks, with 11 feet on them at low water springs, and 8 or 9 fathoms close to. This dangerous patch lies N. by W. ¾ W., 4½ cables from the west extreme of the Tung-ki rocks; Tongmi point bearing N.W. by W. ¼ W., and Si-ki rock S.W. by W.

No indication of these rocks is afforded by discoloured water, and it is recommended that the passage between Tung-ki rocks and the mainland should not be used for the purposes of navigation. A mile North of Tung-ki, and East three-quarters of a mile from Tongmi point, is a cluster of rocks nearly awash.

Si-ki islet, 50 feet high, rises abruptly and is cleft at the summit; Tung-ki bears from it E.N.E. 3 miles, and Chino peak N.N.E. ⅓ E.

Si-ki islet. N.W. 2′.

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Between the two islets the soundings are 11 and 12 fathoms; seen from the westward it appears square shaped.

PAUK SHAO BAY, on the western side of Hie-che-chin bay, affords good shelter, unless the wind comes eastward of South, there being 5 fathoms water with Paukshao point bearing westward of South. Paukshao point is of moderate height, with numerous rocks scattered over its surface. The other point to the westward has a high battery on it; and between this latter point and the high land to the northward is an opening into a harbour, the entrance to which is nearly barred by rocks, and the harbour too shoal for vessels drawing over 6 feet. There is said to be a sunken rock lying N.E. about half a cable from Paukshao point.

CHINO BAY is on the eastern side of Hi-che-chin bay, to the northward of Chino peak, and on its shore is a fort and small village, abreast which the water is shoal, the 2-fathoms line of soundings being half a mile off the land.

Chino reef lies westward from Chino peak, extending 4 cables from the shore; from the outer rock, which does not show at high tide unless there be a considerable swell, Tung-ki bears S.E. $\frac{1}{2}$ E.; Si-ki, S. by W. $\frac{3}{4}$ W.; and East White stone in the northern part of the bay, in line with Round hill, N.N.W. $\frac{3}{4}$ W.*

ROCKS IN CHINO BAY.—Arnold rock, the southernmost of the detached rocks in Chino bay, is a pinnacle with 16 feet water, and 4 to 5 fathoms close around. From this rock, West White stone bears N.W. $\frac{1}{4}$ N. northerly; Yellow stone N.N.W. $1\frac{3}{4}$ miles; a small rocky islet, at mouth of creek leading to Kieshi-wei N. by E.

Bassard (Hugon) rocks, N.W. by W. $\frac{1}{4}$ W. 4 cables from Arnold rock, consist of three pinnacles, the southernmost has 17 feet; the centre pinnacle at half a cable N.W. by W. westerly from the southernmost 6 feet; and the northernmost one-eighth of a mile North of the centre pinnacle 20 feet water. There are 5 fathoms close around these rocks. From the centre pinnacle, West White stone bears N.W. $\frac{1}{2}$ N. northerly; Yellow stone N. by W.; the small rocky islet, at mouth of creek N.N.E. northerly.

Sarah Lucy rocks are situated three-quarters of a mile N.E. $\frac{1}{4}$ E. from Bassard rocks, consist of two pinnacles nearly half a cable apart in a N.N.W. and S.S.E. direction from each other. The northern pinnacle has 3 feet, and the southern 4 feet water, with 4 fathoms close around them.

* *See* enlarged Admiralty Plan of Chino bay, scale, m=one inch, on Sheet 3, East Coast of China, No. 1,968, scale, m=0·24 of an inch.

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From the southern pinnacle Yellow stone bears N.W.; the small rock islet at mouth of creek N. $\frac{3}{4}$ E.

Anchorage.—The best anchorage in Chino bay, is in $4\frac{1}{2}$ fathoms, mud, with the small rocky islet at mouth of creek bearing N.N.E. $\frac{3}{4}$ E., and Yellow Stone in line with East White Stone N.W. by N. There is a creek leading up to the walled town of Keishi-wei, which will admit junks at low water.

Between Yellow Stone and the rocks three-quarters of a mile N.N.W. of it is a channel of $4\frac{1}{2}$ fathoms water; but vessels are recommended not to approach that part of the bay northward of Yellow Stone, as there are several sunken rocks, one of which bears N.W. by W. $\frac{1}{2}$ W. $1\frac{4}{10}$ miles from Yellow Stone, on which bearing it is in line with the northern end of Chino bay hills; from it East White Stone bears N.E. by E. $\frac{2}{3}$ E. and West White Stone, N.W. $\frac{1}{2}$ W. As this rock lies south-westward of all those above water, care must be taken to avoid it when working up the bay. The East and West White Stones will be known by their being the largest of the group.

Vessels drawing less than 17 feet may stand into the bay to the northward of West White Stone, where the depth is $3\frac{1}{2}$ to $2\frac{1}{4}$ fathoms, the water shoaling gradually toward the beach.

HUTUNG POINT.—From Tongmi point the coast takes an E. by N. $\frac{1}{2}$ N. direction about $15\frac{1}{2}$ miles to Cupchi point, and at the distance of $4\frac{1}{2}$ miles is Black rock point, with black rocks off it, and a square white rock on its south-west side; N.W. $1\frac{1}{2}$ cables from the white rock is a sunken rock.

About $2\frac{3}{4}$ miles eastward of Black rock point is the mouth of Hutung river, which falls into the sea on the west side of Hutung point, but it has only 6 feet water over the bar. On its south bank is a fort, and close to the fort a remarkable dome-shaped building like a large beehive, apparently intended for a fire beacon;* this is a good mark in hazy weather, being so easily recognised, indeed there is nothing resembling it on this part of the coast. S.S.E. $1\frac{1}{4}$ miles from the fort is a small islet, surrounded by reefs and detached rocks, one of which, Figure rock, to the eastward, is of a curious shape.

At 3 miles eastward of Hutung point the hills come down to the beach, and on one of their peaks is a conspicuous knob. At a mile off the beach is a flat rock with sunken dangers between it and the shore; there is also a rock awash to the S.E. of it.

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* *See* view on Admiralty Chart.

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CUPCHI POINT* has a rugged summit, 210 feet high, and near the sea is a dilapidated fort.

Cupchi Islet (70 feet) lies N. 15° E. 1 mile from Turtle rock.

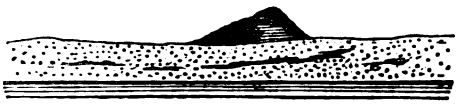
Turtle Rock, 13 feet above high water, lies south $1\frac{1}{4}$ miles from the point, and inside of it are two islets, and four patches of rock. Vessels have no business between this rock and the point.

Five Brothers' Rock.—Between the islets and the point the bottom is rocky and uneven, and a rock on which the steamer *Five Brothers* was wrecked, 28th Feb. 1859, lies 100 fathoms South of the point. The least water on this rock is 9 feet. A ledge of rocks extends 2 cables from the point westward of the fort, its outer end breaking at low water.

Balfour Rock, with 15 feet water, lies about $1\frac{3}{4}$ miles south-east of Cupchi point. From the centre of this rock Cupchi island (summit) bears N. 56° W. $1\frac{2}{10}$ miles; Turtle rock S. 76° W. $1\frac{3}{10}$ miles; and Black mount N. 27° E. $4\frac{3}{10}$ miles.

Two shoals having each $4\frac{1}{2}$ fathoms water lie respectively South, half a cable, and S. 70° W., $2\frac{1}{2}$ cables from Balfour rock. The bottom in this vicinity is very uneven and Balfour rock should not be approached nearer than half a mile.

Black Mount, one of the most remarkable land marks on this part of the coast, is a little black conical hill, rising 230 feet above the sea from a red sand down, at $4\frac{1}{2}$ miles north-east of Cupchi point, and half a mile from the beach: it is conspicuous at night. Reefs extend half a mile from the shore in its vicinity.



Black Mt., N.W. by W. $\frac{1}{2}$ W., 3 miles.

Shag Rock, 4 feet above high water, lies 7 cables off shore N. by W. $\frac{1}{2}$ W. of Cupchi point; and has $1\frac{1}{2}$ to $2\frac{1}{2}$ fathoms around it, except on its S.E. side, where there is a projecting reef. There is anchorage during the N.E. monsoon to the southward of this rock, but there is usually a considerable ground swell.

On the main, abreast this rock, is a fort, with a second a little north of it; both standing on the east side of entrance to a river leading to the walled town of Kiahtsz. The town is $1\frac{3}{4}$ miles from the entrance, and southward of it is a pagoda two stories high.

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* *See* enlarged Admiralty plan of Cupchi point on No. 811, scale, *m* = one inch, and Sheet 3, East Coast of China.

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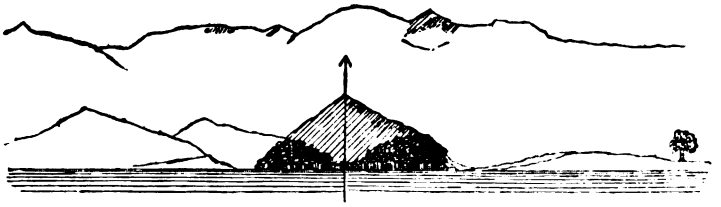
Bar.—There are 6 feet at low water on the bar of the river, which is dangerous and requires the greatest caution while crossing during the N.E. monsoon. There are two channels through, the eastern being the safest. The leading mark for this will be recognised by a single tree, some distance to the left of which are two large clumps of trees, separated by a gap; a remarkable hill will now be seen, the summit of which should be brought in line with the centre of the gap.

Leading Mark.



At the western side of the entrance there is also a fort close to the point.

Situated nearly in mid-channel between sandbanks at the bar entrance is a dangerous rock, steep-to, which uncovers at low-water.*

TUNGAO ROAD.—The village of Tungao stands in a bight of the coast N.E. by E. 15 miles from Cupchi point, the intervening shore being low and sandy. On the bar of the river, west of the village, the sea breaks heavily at low water, and outside the bar the water shoals suddenly. The best anchorage in Tungao road is with the centre of Tungao village N. 54° E., and South Pagoda N. 22° W. in 5¼ fathoms; this will be found a fair roadstead in the N.E. monsoon with good holding ground, but a heavy swell will often be found setting in from the southward.† There are two pagodas in the neighbourhood, one on the low land at the east side of the river's mouth; the other on the hills 2 miles to the northward.

S.E. 2½ miles from the village is White rock. On approaching the coast near Breaker point from the south-westward this rock cannot be mistaken, it is 20 feet high, peaked, and topped with white, and the most certain mark to identify position. When seen from the eastward it loses distinctness. Half way between White rock and the village is a creek with a fort upon the hills east of it. The land near the coast is low, with several fishing villages in the sandy bays, the boats belonging to which are numerous, and being of different shape and smaller than those of Hai-mun and Cupchi, will enable a vessel to identify her position in a fog.

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* Inside the inner fort is a second rock, which should be passed on the port side when entering.

† H.M.S. *Frolic* at anchor in Tungao road on May 10th, 1876, experienced a typhoon and shipping heavy seas was obliged to slip her cables and put to sea.

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Hai-Loong rock.*†—This sunken danger, (over which there is a depth of nine feet,) lies directly in the track of vessels proceeding from the anchorage in Tungao road round Breaker point when keeping inshore to avoid the north-east monsoon.

From the rock, Slope hill bears N. 23° E.; Black mountain, S. 80° W.; and North Pagoda, N. 26° W.

Near the centre of rocky ground, carrying 5 to 10 fathoms, are two pinnacles lying north and south, 50 yards apart, with only 11 feet water on them at low tide, the lead slipping off into 6 fathoms on either side.

BREAKER POINT,‡ lying 7 miles eastward of White rock and E. by N. $\frac{3}{4}$ N. 23 miles from Cupchi point, may be easily distinguished by its fine lighthouse: it may also be known by a black dome-shaped hill rising 111 feet from a red sand drift on the point, whence the hills trend northward and westward, dipping suddenly at their extremity. Off the south-east and south-west extremes of the land are two small islets; a dilapidated fort stands on the point within. Detached reefs lie off the shore, which should not be approached within half a mile.

The Islet.—At 2 miles westward of Breaker point is a small islet, (52 feet high,) having Flat rock to the south-eastward of it, distant $1\frac{1}{16}$ miles.

Flat reef is a bed of dark-coloured rocks, three cables in extent; crowned with two conspicuous masses eight feet above high-water mark. A quarter of a mile W. by N. from the southernmost and largest of these (Flat rock) is *Black rock*, 10 feet high.

Sunk rock has but 7 feet water over it at low water springs; it is the shoalest part of a rocky patch about a cable in extent. From this rock the apex of the islet westward of Flat reef bears N. by W. $\frac{3}{4}$ W., distant 7 cables; and Flat rock E. $\frac{3}{4}$ N., $7\frac{1}{2}$ cables.

Corea rock, a pinnacle with 12 feet water over it, and from 3 to 6 fathoms around, is the most southern of the group of dangers lying westward of Breaker point.

From the centre of this rock the islet (52 feet) bears N.N.W. $1\frac{2}{10}$ miles; Flat rock N.E. $\frac{1}{2}$ N. $\frac{3}{4}$ of a mile; and Breaker point lighthouse S.W. by W. $\frac{1}{4}$ W. $2\frac{8}{10}$ miles. The rocks marked "*25* feet" kept in line with the lighthouse (N.E. by E.) will clear the Corea rock to the southward; while if running in for the anchorage, the "*Remarkable Square Stone*"§

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* On which the steamship *Hai-Loong* struck in 1872.

† Captain R. H. Napier, H.M.S. *Magpie*, 1880.

‡ *See* enlarged Admiralty plan of Breaker point, No. 811.

§ This stone is very conspicuous; and lies West four miles from the lighthouse.

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(85 feet high), must not to be brought to bear to the westward of north-west.

SOUNDINGS.—The lead may be relied on in thick weather at night as at three miles to the south-westward of Breaker point, nothing less than 9 fathoms (mud) will be obtained, so long as the shore is not approached to within that distance; and to the southward and south-eastward; at 2 miles, a regular mud bottom with casts of 11, and occasionally 12 fathoms. A sounding of 8 fathoms would indicate proximity to the reefs.

Anchorage.—Fair anchorage will be obtained during the north-east monsoon at half a mile westward of the islet (52 feet high) in 5½ fathoms mud, with Dome hill and the islet in line.

LIGHT.—A light is exhibited from a lighthouse erected (close seaward of the boulder) at Breaker point. It is *occulting;* alternately showing for *eight seconds;* and suddenly disappearing for *two seconds*, elevated 152 feet above the sea and should be visible in clear weather from a distance of 19 miles. It shows *white* seaward, between the bearings of N. 53° E. and S. 55° W.; and *red* inshore of those bearings to the land. The illuminating apparatus is dioptric, of the 1st order. The Lighthouse is 120 feet high, circular, and constructed of iron. It is painted black and white in horizontal bands: the dwellings and boundary wall white.

Fog signals.—When during foggy weather a bell, fog horn, steam whistle or other sound, is heard indicating the proximity of a vessel, two guns will be fired with an interval of 10 *seconds* from the lighthouse, and if the vessel's fog signal continues to be heard, the firing will be repeated after an interval of 10 *minutes.**

TIDES.—It is high water, full and change, in Chino bay, at 7h. 0m.; at Cupchi point, at 7h. 46m.; at Breaker point at 10h. 0m. (approximate); and in Hai-mun bay and at Good Hope cape at 9h. 0m.; rise, 6 to 7 feet.

In January, at the distance of 5 miles eastward of Tungao road the ebb ran to the westward one knot per hour on the 12th day of the moon, and no flood tide was perceptible during that month. There is a tide race with the flood off the southern promontory of Good Hope cape which at times is very turbulent.

From observations on the tidal streams, from January to May, between Hong Kong and Breaker point, the ebb ran to the eastward, but, generally speaking, very little tide was experienced. To the eastward of Breaker point, however, the flood set to the eastward, which is its direction throughout the north-east coast of China.

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* The lighthouse is in latitude 22° 56′ 30″ N., and longitude 116° 28′ 10″ E. (approximate). And bears E. ¼ N. 7 cables from the Fort.

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TONG-LAE POINT is 4½ miles N.E. ½ N. from Breaker point, and about a mile westward of it is the entrance to a creek leading to the walled town of Tong-lae. On the eastern side near the entrance is a remarkable dome shaped tower and a low square fort.

Tower.

Fort.

As an anchorage, it is unsafe and should not be used, unless in case of extreme necessity, and them only by vessels of 12 feet draught and under. Sunken rocks abound along this portion of the coast, one of which lies 6 cables off the land, with the fort bearing N.W. by N., and Rocky point N. by E. ¾ E.

Rocky point is the low extreme of the land N.E. 1¼ miles from Tong-lae point; thence the coast trends northerly, and at the distance of 4½ miles is a headland with reefs known to extend a quarter of a mile south-east of it. It should not be rounded at less than one mile distance.

HAI-MUN BAY and RIVER.—N.E. ½ E. 7 miles from the above headland is Hai-mun point, and between them Hai-mun bay, which has a general depth of 6 and 7 fathoms, and at its head the entrance of Hai-mun river with 10 feet on the bar at low water.* The town is built on the left bank, one mile within the entrance, and north of the town the river turns to the westward. The land being low to the northward, a canal communication with the estuary of the river Han will most likely be found.

The highest part of the hills at the back of Hai-mun point forms two peaks, on the highest of which is an artificial mound 590 feet above the sea. There are three pagodas on the land to the northward of the bay, two of which are on the hills, and can be seen in clear weather from Namoa island; the other is on the low land.

Parkyns rock.—At 9 cables southward of Hai-mun point are two rocks on which the sea breaks only when there is a heavy swell. From the southern, Parkyns rock, the artificial mound bears N. ¾ E., Good Hope Cape, E.N.E., and Rocky Head point, on east side of entrance of Hai-mun river, N.W. Rocky Head point in line with west peak of Pagoda range, bearing N. 50° W., passes close to south-west side of the rocks; there is a passage between them and the main. There is no clearing mark when approaching this danger from the southward.†

* The soundings in Hai-mun bay will be found *deeper* than shown on the chart, caution is therefore necessary when approaching the anchorage at night.—Captain R. H. Napier, R.N.

† *Ibid.*

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A rocky ledge with only 2½ fathoms on its south end, extends 6 cable from the fort on the east point of a sandy bay, 1¼ miles E.S.E. of Rocky Head point. The above mark passing close to Parkyns rock, points to its southern edge, from which the fort bears N.E. On this ledge is a rock awash at low water lying W. ¾ N. half a mile from the fort, with the west peak of Pagoda range in line with a large stone near the centre of the first sandy beach eastward of Rocky Head point bearing N.W. ½ N.

Near the anchorage of Hai-mun river is another rock showing at low water, from which the south extreme of Hai-mun point bears E. by S., Rocky Head point N.E. ¼ N., and the west peak of Pagoda range N.W by N.

Caution.—On many occasions both steamers and sailing vessels have nearly been lost by mistaking Hai-mun point for Good Hope Cape in thick weather when the island of Namoa was not visible. These points bear a marked resemblance to each other, both having three distinct high points with sandy beaches between. In such weather, the low white sandy shore of Hope bay is often not visible.

HOPE BAY is between Hai-mun point and the south extreme of the Good Hope cape, which bears E. by N. ¾ N. distant about 8½ miles. Detached rocks lie half a mile off the coast for 3½ miles N.E. of Hai-mun point, so that vessels should not close this part of the shore nearer than three-quarters of a mile, until beyond that distance, when the sandy beach is steep-to.

There is secure anchorage in the N.E. monsoon on the southern side of the cape, to the north-west of Tide point. The smoothest water will be found in the first little sandy bay westward of the point, near a fort and a large tree.* Sunken rocks extend a cable from the fort point; otherwise this bay is clear and the lead the best guide.†

Cockchafer rock.—At the western extreme of this sandy bay is Peaked rock, S.W. by S. of which, distant 4 cables, is a small sunken pinnacle rock on which H.M. gunboat *Cockchafer* struck in 1868. It has 4 feet on it at low water, with 5 fathoms close-to on either side.

At 1½ miles N.W. of Peaked rock is the entrance to a creek which communicates with the river Han, 3 miles above Swatow. The creek has 7 feet water over the bar, which is barely a cable across, and is defended by a fort. Reefs extend south-westward 3 cables from this fort to a rock awash at high water, rendering the straight channel impassable to large

* H.M. Surveying Vessel *Nassau* found secure anchorage in 25 feet (mud), with the following bearings: Peaked rock (pyramid shaped) N. 66° W., and High Cape summit N. 53° E. Captain R.H. Napier, R.N.

† *See* Admiralty chart, No. 2789.

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fishing boats at low water; at this time of tide they leave the rock to the eastward and pass between it and two islets off the fort. In the event of a wrecked crew wishing to reach Swatow, this would be the best route, as few boats could live in the tide race off the cape.

In December 1871, H.M.S. *Dwarf* passed through this channel finding 1 to 3 fathoms water; and it was then judged to be only available, at high water, for vessels drawing 7 feet; the northern entrance being shoal.*

SWATAU AND THE RIVER HAN.†

GOOD HOPE CAPE is the southern, and Pagoda hill the northern boundary of the entrance to the river Han. The cape, 163 feet high, is the north-east extreme of a hilly peninsula, of which, High Cape summit, 433 feet above high water, is most prominent when seen from the north-east, the top assuming a flattish appearance and suddenly falling on either side. Vincent range (the hills to the north-west of the cape) rises to the height of 598 feet at 4¼ miles from High Cape summit, but presents no striking feature, as it extends for 2 miles with little difference in height. Between this range and the cape is a plain from which hills rise suddenly to an elevation of 330 feet. North 1¾ miles from the highest part of Vincent range is Signal hill, on the summit of which, 377 feet high, is the signal station from which the approach of vessels is reported: to the southward, the hill extends in almost a level ridge; to the northward, it falls steep.

LIGHT.—On **Good Hope cape** (south side of approach to Han river) there is exhibited from a lighthouse, a *fixed* and *intermittent* light which shows fixed *red* from S. 32° E. to S. 10° E.; *white* (with an eclipse of about 3 seconds duration every minute), from S. 10° E. through south and west to N. 8½° E.; and *red* (with an eclipse of about 3 seconds duration every minute), from N. 8½° E. until shut in by Ma-urh point. It is 171 feet high, and in clear weather the *white* light should be visible 15 miles, and the *red* 8 miles. The light tower 22 feet high is constructed of iron. The tower, dwellings, and boundary wall are painted white.

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* It is so stated in the edition of 1874, probably a misprint for the *boats* of H.M.S. *Dwarf*. From the cursory examination made by Lieutenant A. Balfour, R.N., of H.M.S. *Nassau*, who proceeded through this creek to Swatow, with that vessel's steam cutter in 1878, it appears probable that a vessel of 12 feet draught might pass the bar, and proceed for a distance of about a mile, to a point where there is a Fort (on the proper left bank); but the bar itself (which is about 150 feet broad), requires the greatest caution, above this 5 feet was the least water obtained, and the channel was found to be very narrow and intricate throughout.—Captain Napier, R.N.

† By Mr. G. Stanley, Master, R.N., 1865. *See* Admiralty Charts :—Entrance of the River Han, No. 2,789, scale, $m = 0{\cdot}75$ of an inch; and Swatau port, No. 854, scale, $m = 3{\cdot}1$ inches.

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Fog Signals.—In foggy weather, in answer to signals from seaward two guns will be fired with interval of one minute, and repeated after an interval of 15 minutes.

Position.—Latitude 23° 15′ N., longitude 116° 49′ E. (approximate).

DOVE ROCK, with only 7 feet on it at low water, was discovered during the progress of the survey. From it the south summit of Double island bears W. by N. ¼ N., distant 5 miles, and Green islet S.S.W. ½ W. 4⅓ miles.

Clearing Marks.—The north summit of Kakchio promontory touching the south extreme of Double island W. ½ N., leads three-quarters of a mile northward of Dove rock; the south extreme of Sugar-loaf island touching the point of land abreast the island, W. by N., or the north extreme of Fisherman island, just showing clear of the north extreme of Sugar-loaf, leads three-quarters of a mile southward; the east extreme of Green islet touching the north part of High Cape summit, S.W. ½ S., leads nearly a mile eastward; and Brigg island its own breadth open east of Fort island, N.N.E. ¾ E., leads three-quarters of a mile westward, in not less than 18 feet at low water springs.

Buoy.—In 1880, an Automatic (or whistling) *buoy*, was placed to mark the Dove rock. It is moored in 4½ fathoms water about 2 cables south-eastward of the pinnacle, on the south-east extremity of the shoal ground; red and black chequered; 10 feet in diameter at the water line.

GREEN ISLET, BILL ISLET, and SQUAT ROCK.—The northern face of Good Hope Cape is half a mile long, and terminates to the westward in a bold point on which is an old fort. N. ½ E., half a mile from the fort, is Green islet, 72 feet high, from the north-east side of which rocks extend a cable, their outer part being 2 feet above high water. In the passage between the islet and fort is a reef of rocks, the tops of which are not covered at high water.

Bill islet, 50 feet high, bears N.N.W. 2¾ miles from the cape, and is nearly one mile off shore. At a third of a mile S. by E. ¾ E. from this islet is Squat rock, the part showing above high water being a large square stone about 15 feet high; and a quarter of a mile S.W. by W. from Squat rock is a reef, more than a cable in extent, which breaks in the calmest weather, the top being awash at high water.

SUGAR-LOAF CHANNEL.—Peaked rock, bearing N.W. ¾ N. 2½ miles from Bill islet, lies off the south point of entrance to Sugar-loaf channel, which is formed between the west side of Sugar-loaf island and the coast abreast it. This channel (although only 2 cables wide) is excellent, either side being quite steep to a quarter of a cable from the shore. It is always used by steamers, and frequently by sailing vessels.

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Peaked rock, 25 feet high, can only be seen when it is standing out clear of the land. The coast for more than a mile north-west of it is fringed with low-water rocks and steep-to; the coast to the southward is cut up by several conspicuous sandy bays, with several detached rocks lying some distance off shore.*

SUGAR-LOAF ISLAND, forming (with Double island) the northern shore of the Sugar-loaf channel, is 200 feet high; from its south extreme distant about 2 cables, are two rocks the northern of which dries 8 feet, the southern being 1 foot above high water.

LIGHT.—From a lighthouse erected on Sugar-loaf island is exhibited a *fixed white* light of the 6th order varied by a *red* flash every half minute; it is elevated 200 feet above the *sea*, and should be seen in clear weather 8 miles. The tower 22 feet high is of iron, and painted *red*. The keepers dwellings, white.

DOUBLE ISLAND, bearing N.W. by N., 4 cables from the north extreme of Sugar-loaf, only appears double when seen from the south-east. The white walls and tops of houses are the best guides to recognise it from seaward. On the western side is the custom house; the principal inhabitants are Chinese. The southern summit of this island, 126 feet, is the highest, and has a square top, being the walls of an old fort. At 3 cables S.S.E. ½ E. from the summit and 1½ cables off shore, are rocks which cover at 5 feet rise of tide; the channel between them and Sugar-loaf cannot be recommended.

Pilots.—Double island is the pilot station. The pilots are Europeans, and are under the direct control of the commissioner of customs. The charge is 2½ dollars for every foot of draught under 12 feet, and 3 dollars if over that draught.†

FISHERMAN ISLAND, about 75 feet high, is half a mile westward of Double island, and forms with it the continuation of Sugar-loaf channel. On the point of land immediately off its south end is a large white house, formerly used as a depôt for coolie emigration.

CAUTION.—Between Double island and the anchorage off Swatow are numerous rows of fishing stakes, some of which stretch across the fairway, and are much in the way of navigation, especially at night. Vessels not unfrequently come into collision with them, whilst boats have been frequently swept by the tide against the submerged nets, causing loss of life in several instances.

* Vessels making Swatau by the Sugar-loaf channel, will find a good clearing mark for Peaked rock, and the "rock awash" which bears S.S.E. ¾ E. 6 cables from it by not allowing Green island to show open of Good Hope cape.—Captain R. H. Napier, R.N.

† These charges are subject to alteration.

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PAGODA HILL, the northern boundary of the entrance to the river, which looks remarkably like an island, will be easily recognised by the pagoda on its summit; the top of the pagoda is 260 feet above high water. Thence the low sandy coast runs in a south-westerly direction towards Double island, and terminates in an extensive sand bank, which leaves the channel north of Double only half a mile wide; that portion of the bank immediately opposite Double is steep-to.

The shoal water outside Double island can scarcely be called a bar, as the water deepens so very gradually on either side of it. The north extreme of the Outer flat is $1\frac{1}{4}$ miles East from Double island; the flat then extends in a S.S.E. direction for 2 miles and carries 12 feet at the lowest tides. North of Double island the water is deep, 5 fathoms; but it again shoals, $3\frac{1}{2}$ fathoms being carried for $1\frac{1}{2}$ miles to the westward; it again deepens towards Swatow, off which ships moor in 7 and 8 fathoms.

JOACHIM BANK, facing the low land south of Pagoda hill, has extended to the southward. Brig island, open its own breadth east of Fort island, now leads over in not less than 15 feet at low water springs.

KAKCHIO PROMONTORY, 4 miles westward of Double island, when seen from seaward has the appearance of one continuous hill, the southern part being 486 feet high, and the northern 296 feet; the numerous ravines by which it is cut up are only seen when close to. On its northern side is the English Consulate (in lat. 23° 20′ 43″ N., long. 116° 40′ 29″ E.) with a number of European houses, but they can only be seen when close up to the anchorage.

Between Fisherman island and this promontory, the coast falls back about 3-quarters of a mile, forming a large deep bay in which are a few islets and rocks; at low water the mud dries out to its extremes.

SWATAU.—The Chinese town of Swatau stands on the northern bank of the river, nearly a mile distant from Kakchio, and the whole of the Hongs are on this side. The shore runs in an easterly direction from the town for more than a mile, and the greatest elevation on it is only 28 feet; it then curves round to the northward and eastward to the point opposite Double island, and forms a bay half a mile deep, faced by a mud bank.

The Anchorage for foreign merchant vessels, is immediately fronting the town of Swatau, where 6 to 8 fathoms are found, with good holding ground, men-of-war usually anchoring on the south side of the river, abreast the foreign settlement.

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ROCKS; Buoys; and Beacons:—

Bottefurh rock, 50 feet high; lies off the north extreme of Kakchio promontory from which it is separated by a very narrow channel.

Wyoming rock lies two-thirds of a cable N.N.W. of Bottefurh rock. It has 4 feet of water over it at low water springs tides.

Wyoming rock buoy is placed about 120 feet N.E. from the rock. It is painted *black* with an inverted frustrum cage and has 7 fathoms water over it.

Madras rock.—Is a pinnacle with not more than 8 feet water over it at low water spring tides. From it the northern extreme of Bottefurh rock bears N. 78° E., and the flag staff of the Chinese Imperial Customs N. 7° E.

Madras rock buoy.—A black conical wooden buoy has been placed in 3½ fathoms water about 120 feet N. by E. from the rock. It is surmounted by a *black* spherical cage.

Chento rocks are a cluster of three, one being a pinnacle of 3 feet diameter at top, and the whole not occupying a space of more than 15 feet square. They have from 4½ to 5 feet over them at low water spring tides.

From the rocks the flag staff of the Chinese Imperial Customs bears N. 15° W., and the north extreme of Bottefurh rock N. 74° W.

Gochang rocks, the highest of which are covered at *high* water; lie with Gochang point bearing S. 31° E. distant about 350 yards, and Bottefurh rock N. 76° E. On the highest rock is a *black stone beacon* 5 feet high and carrying a high pole surmounted by a *black* wicker basket.

Mud flat buoy.—An iron nun buoy painted red and surmounted by a black spherical cage is placed on the southern edge of the Mud Bank half a mile E. ½ N. of the Customs Pier. It is moored in 2 fathoms water.*

Wreck buoy.—A 4 feet square iron tank, painted green with the word *Wreck* and the numeral 4 on it in white has been placed 60 feet south of a sunken junk in 6 fathoms water.

HAN RIVER.—The Han above Swatau is navigable 25 miles above where the Admiralty survey terminates, to a place called Tiaka, where a bridge crosses the river. Tiaka is about 12 miles from Chau-chu-fu, the capital of the province. Another branch of the river runs to Chau-chu-fu from Swatau, but it is so shallow that it is only available for flat bottomed boats.†

* It marks the southern edge of the mud bank on the north side of the harbour.

† H.M.S. *Dwarf*, in 1871, visited Chuk-yuen, said to be about 30 miles above Swatow.

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The Han derives its waters from two main branches, one of which flows from the mountains on the west in the heart of Kwangtung province, whilst the other issues from the province of Fukien. Uniting at San-ho-pa with a third less important stream, they form the river which flows past Chau-chu fu, and expands below that city, flowing through a delta embracing a wide expanse of alluvial and highly fertile soil.

There are numerous sets of fishing stakes* in the river, and as these are always placed in the deepest water and a passage left between them for junks, they serve as good guides to its navigation. But at night they are dangerous to boats sailing down with a strong tide, which are liable to be swept between the stakes and dismasted, or capsized by the guys which support the stakes. There are occasionally fishing boats with lights fast to the ends of these stakes.

The PORT of SWATAU,† opened to foreign trade by the Treaty of Tientsin in 1858, is the shipping port of Chau-chu fu, 35 miles inland, and since its establishment as a centre of foreign commerce, has been the means of creating a large emporium at San-ho-pa, at the confluence of two branches, 40 miles further up the river Han. The British consulate is on the south bank of the river, at the foot of the rocky range of Kahchio, immediately facing the town of Swatau. The consular buildings are on a small piece of level ground, together with a few other houses and a Chinese street. The residences of other foreigners are widely scattered, but a few have established themselves near the town, in front of which, along the river, several handsome houses have been erected including that of the Chinese maritime customs. At the eastern end of the settlement a sugar refinery with all the latest modern machinery has been recently established. The large expanse of mud left dry, or covered only with a few inches of water, on both banks of the river at low tide, has rendered the construction of jetties necessary, of which there are three; these structures are seen projecting into the stream to a distance of some 200 yards. The consular jetty is built of rough blocks of granite. The military mandarin resides at the small, picturesque fort on the west of the town, in close proximity to the custom house.

Supplies, Trade, &c.—The markets are fairly supplied with beef, mutton, fish and fruit, and in winter with wild-fowl, good poultry is difficult to procure. Small repairs to ships, spars, &c., can be executed, and there is a hulk capable of heaving down vessels of 300 tons or more, coaling is effected in native lighters. There are no docks, the nearest being at Amoy, and the rise of the tide is insufficient for the examination of the bottoms of

* Lieut. and Com. Howard Kerr, R.N., H.M.S. *Cockchafer.*

† Abridged from "The Treaty Ports of China," page 230.

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ships grounded on the soft mud. There is constant steam communication with Hong Kong, Amoy and Foochow, from which places stores of all kinds, not procurable at the port, may be provided in a few days.

The foreign trade of Swatau has been very rapidly developed, but several causes have concurred towards confining it almost exclusively in the hands of native or Singapore Chinese. The tendency of the native traders to engross the profits of the commerce hitherto carried on by foreigners, now becoming prevalent in China, is nowhere more strongly marked than at Swatau. The importation of foreign goods such as cotton fabrics, opium, &c., is done for them by Hong Kong firms; and the native import of bean cake from New-chang as well as the native exports of tobacco, paper, &c., are conducted by Chinese agencies. In 1882, the net value of the foreign trade amounted to 5,545,168*l.* 1,521 vessels of all nationalities entered and cleared.

The Climate, and especially Double island, shares with Amoy the well-merited repute due to its maritime situation, Swatau being even considered by some authorities to be the healthiest port in China. During the summer months, although the thermoneter ranges as high as at Hong Kong, a refreshing sea breeze tempers the heat throughout the day. When the peak of Namoa island is seen clear and distinct from Swatau, it is considered to presage fine and settled weather. Double island affords sea-bathing, and attention has been drawn to this spot as a possible sanitarium for Hong Kong and the southern ports.

The position of Swatau at a point opposite the Bashee channel renders it peculiarly exposed to typhoons, the principal range of which is in this narrow seaway. Scarcely a summer passes without the occurrence of one or more of these storms, the excessive violence of some of which has necessitated, among other precautions, the construction of flat roofs to all large buildings.

On the approach of a typhoon vessels must either weigh, and run up the river until nearly north of Flower island or make for the typhoon anchorage in Clipper road, Namoa strait, which if a proper look-out be kept can usually be reached in time by steamers.*

TIDES.—It is high water, full and change, at Double island, (approximately), at 3h., springs rise 9 feet; but the tides are irregular and much influenced by the prevailing winds.† These observations are by Mr. Geo. Stanley, R.N., commanding H.M. surveying vessel *Dove*, but Lieut. Rising, R.N., remarks that the rise and fall of ordinary spring tides

* Remarks by Captain R. H. Napier, R.N.

† According to the Harbour master of the port (who had an experience of many years) the rise of tide at springs was found never to exceed 6 feet.—Navigating Officers' Remark book, *Sheldrake*, 1880.

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is only 7 feet, which is a great drawback to the construction of a dock at this port, although one is much required, as it is frequently crowded with vessels during the summer months, mostly engaged in carrying bean cake from Newchwang, and returning northward with sugar and rice. It is also stated that during the S.W. monsoon, for a number of days there may be only 2 or 3 feet rise. The mud also is so soft that it is not practicable to beach a gun-boat for the examination of her bottom.

In the N.E. monsoon the duration of the ebb and flood streams is nearly equal, the ebb obtaining the greatest velocity. Only after one or two days calm the water falls to zero, and quite irrespective of the moon's age; consequently there is generally more water on the Outer flat than shown on the chart.

In the S.W. monsoon for a number of days there may be only 2 or 3 feet rise, the sluggish flood stream just causing slack water for a short time. Vessels drawing 17 feet have been known to wait 10 days off Double island, there not being sufficient rise of tide to enable them to stand out.*

DIRECTIONS.—A vessel of heavy draught running for the entrance of the river Han before the N.E. monsoon should pass outside or eastward of the Dove rock. To do this, do not bring the east extreme of Fort island to the eastward of N. ½ E., until the clearing mark, the east extreme of Green islet on with the north part of High Cape summit, S.W. ½ S., is made out, when steer for it until Sugar-loaf channel is well open. Bill islet and Squat rock will then be easily recognised, and by steering in with Bill islet on with the extreme of the cape of Good Hope bearing S.S.E., it will lead between the Outer flat and the spit extending eastward from Double island in not less than 15 feet at low-water spring tides. When nearing Double island great attention must be paid to keep this mark exactly on, as the channel is only two cables wide.

If the wind hangs to the northward, and the vessel is unable to keep the latter mark on, she had better bear up for Sugar-loaf channel, which is 2 cables wide, steep-to on either side, with the tides setting directly through. The only drawback against using this channel is, that in a light monsoon vessels are liable to lose the wind.

Vessels of light draught, 12 and 14 feet, can easily run in for the entrance north of Double island. Sugar-loaf channel a little open is a good mark, and leads south of Joachim spit. When Bill islet is on with

* In January the tides were found variable, the flood running longest, and sometimes for 12 hours, with an interval of slack water of half an hour, at change of moon; the ebb ran the stronger, from three to four knots an hour.—Remark Book of Com. C. C. Rising, R.N., H.M.S. *Midge*.

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High Cape summit, steer in N.W. by N. until Bottefurh rock is seen clear of the north extreme of Double island, when keep in mid-channel until past the latter island, and then a W. ¼ N. course will lead up to the anchorage. Give the Wyoming rock a good berth, there being no occasion to pass within 2 cables of it.

Vessels have plenty of room to back and fill when dropping down with the tide towards Double island, the only thing to avoid being the fishing stakes. The edge of the bank abreast the island is steep-to, and can be approached to a cable. If the wind is far round to the eastward, vessels generally wait a tide or two off Double island until it has sufficient northing to enable them to leave the port. If obliged to tack do not stand too close to the southern shore, as during the N.E. monsoon there is generally a swell setting in, especially between Green and Bill islets.

Bound to the river Han from the southward, the cape of Good Hope may be rounded at about a ¼ of a mile steering northward towards Pagoda hill, until Bill islet and Squat rock are seen, "and the eastern clearing mark for Dove rock on; after which (passing about 3½ cables eastward of Bill island), the eastern end (hummock) of Double island seen clear of the east extreme of Sugar-loaf island will lead over the bank in not less than 15 feet water. When Peaked rock bears west, steer mid-channel (N.W. ½ W.) until the N.E. extreme of Double island bears E. by S.; from this a westerly course, passing close outside both rows of fishing stakes, leads direct to the anchorage." There is a tide race off the cape during the flood.

In going out, vessels of heavy draught can only cross the bar at the top of high water, and usually anchor off Double island to await the flood. With a westerly wind, sailing vessels may pass out through the Sugar-loaf channel without the necessity of tacking, but the risk is seldom ventured upon.

In crossing over to Takau south of the Formosa banks, vessels are not likely to be helped by the northerly current.

FORT and BRIG ISLANDS.—E.N.E. 1¾ miles from Pagoda hill is Fort island, with a fort on the table-land at its western end; the channel between the island and the main is shoal. This island makes double from the S.W.

Brig island, so called from a rock at its south extreme which appears like a brig when seen in an east or west direction, lies N.E. ¾ E. 3¾ miles from Fort island, the depths between varying from 2½ to 4 fathoms, the most water being towards Brig island.

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NAMOA ISLAND,* 12 miles long, east and west, and 5¾ miles wide at its broadest or eastern part, is separated from the main by a channel about 3½ miles wide with depths varying from 3 to 6 fathoms. The three peaks of this island, West peak, 1,830 feet, Namoa peak, 1,934 feet, and Saddle peak, 1,794 feet above the level of the sea, form the most prominent landmarks in the neighbourhood.† Notwithstanding its barrenness, the island is exceedingly populous, the fisheries affording a livelihood to the greater portion of the inhabitants. Caution is required to avoid the large fishing stakes which almost surround this island in deep water, some of which are large enough to carry away a vessel's jib-boom.‡ The passage inside the island is lined on both sides with these stakes. During the N.E. monsoon the opium vessels used to anchor off Baylis bay, at the west end of the island, remaining from October till May. In the other monsoon they used to lie 1¼ miles to the northward in Clipper road, abreast Stewart's house, as the swell setting round Clipper point renders the other anchorage inconvenient. The anchorage in Clipper road is in 6 to 7 fathoms, very good holding ground.

Local knowledge is necessary when approaching these anchorages from the southward, as the knolls off the south-west end of Namoa are said to shift, and there was formerly a shoal in their position with as little as 11 feet on it. The eastern channel between North point of Namoa and Fort head is much wider and has general depths of 7 to 4 fathoms.

KNOLLS off S.W. end of NAMOA.—Clipper point, the west end of Namoa, is fronted to the southward by several knolls of sand, which shift, owing to the freshes from the river Han. In 1844, three of these knolls were lying with Clipper point in line with Breaker island; from the westernmost, of 12 feet water, Pagoda hill bore N.W. by W.; from another of 17 feet it bore W.N.W.; and from the third of 18 feet it bore West. There was another of 14 feet with Pagoda hill W. by N., and Clipper point N.N.E. Vessels approaching the western entrance to Namoa straits from the southward, after passing close eastward of the Dove rock buoy should

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* *See* Admiralty plan of Namoa island, No. 1,957; scale, $m = 0{\cdot}7$ of an inch.

† West peak may easily be mistaken for Dome peak from the south-westward.

‡ The Commander of the French ship of war *Bouragne* reported in 1873, that from the point west of Crab island, on the south shore of Namoa, there extended out for two miles, a long series of fishing stakes with scarcely any passage between them. These stakes were of such large dimensions that they would cause serious damage to a ship striking them in a seaway. He therefore recommended that steam vessels proceeding against the N.E. monsoon should not approach this shore at night when the wind is strong, but take the passage westward of the Lamock islands. In 1877 large fishing stakes in a continuous line from S.E. to N.W. extended for one mile from Baylis bay (Clipper point).

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steer N.N.E. ½ E. for Brig island, which course will lead clear of all known dangers south-westward of Clipper point.

BAYLIS BAY is the first little bight on the west side of Namoa northward of Clipper point, and there is a fort on the ridge westward of it, and an outwork on the beach. Three knolls lie off this bay: the first, with only 5 feet water over it, bears W. by N. rather less than a cable from the fort point; the second, with 9 feet on it, N.W. ¼ N. a cable from the point; and the third, with 11 feet on it, N.W. ¾ N. a quarter of a mile from the point. From the latter the summit of Brig island bears N.W. ½ N., and the summit of Fort island W. by S. ½ S.

From Baylis bay a bank commences that borders the north-west coast of Namoa for 2½ miles; its greatest distance from the shore is 4 cables, which is abreast Stewart's house; the lead gives no warning, and there are only 9 feet on its edge.

Supplies.—Baylis bay and Clipper road must be considered more as safe roadsteads than harbours, as from the velocity of the tide and the fetch of the sea, laden boats would frequently have much difficulty in passing to and fro. Water may be procured with great facility, and there is no difficulty in obtaining fresh provisions.

FOLKSTONE ROCK, with only 5 feet on it, lies with the south extreme of Brig island in line with north-west head of Fort island, S.W. by W. ½ W.; Coffin island (the largest of a cluster of islets 2¾ miles north of Brig island) N.W.; and the flagstaff at Stewart's house in line with a white-washed rock at the back of it, S. by E.

The south extreme of Brig island, just open of the north-west extreme of Fort island, leads south of Folkstone rock, and also of the shoal which extends nearly all the way from Brig island to Breaker island; the latter is a peaked rock with several others around it, which must not be approached nearer than 2 cables on its western side. To the eastward of Breaker island, shoal water extends a great distance from the northern shore; its south edge of 3 fathoms bears East 3 miles from the island.

SHOAL BAY is a deep indentation in the western part of the north coast of Namoa. There are two islets and several rocks in it, and the land at its head is low, and only a mile across to the southcoast.

NANGAOU BAY, the next bight eastward of Shoal bay, has at its head a walled town, the residence of the magistrate of the district. Vessels drawing less than 18 feet may stand into this bay until Pagoda island, on its eastern side, bears E. by N.; but during the N.E. monsoon there is a considerable swell in it; when the entrance to Clallum bay, on the opposite shore, will be found a more eligible anchorage, and vessels

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will be in a better position to avail themselves of the land wind, which usually draws to the northward in the morning.

The north point of Namoa, forming the eastern limit of Nangaou bay, has a double peak over it, and rocks extend 3 cables from its north-eastern face.

PAGODA and SOUTH BAYS.—From Clipper point the southern coast of Namoa trends east 5 miles to a small bay with a pagoda upon its eastern point. South bay, four miles farther eastward, affords good shelter in the N.E. monsoon ; rocks extend 1¾ cables southward from its eastern point. Vessels drawing 18 feet may run into this bay until the extreme of the point bears S.E. About half a mile south-east of the point is Crab island, a low flat islet, and in the channel between it and Namoa the ground is foul. About 1¼ miles eastward of South bay is Three Chimney bluff, a bold bluff with three tall chimneys on it.

Glengyle rock,* on which the steam vessel *Glengyle* was lost in 1875, has one foot over it and breaks at low water spring tides ; it is of small extent, and lies one-third of a mile off the south-east point of Namoa island ; with the following bearings, namely, East point N. 6° E., Oeste rock S. 29° W., Three tall chimneys S. 66½° W.

The north point of Crab island in line with Three Chimney bluff, bearing W. ½ S., leads southward of Glengyle rock ; and Dome island seen midway between Oeste and Ruff rocks, bearing S.S.W. ½ W., leads eastward of the rock.

The wreck of the *Glengyle* was in 1877 lying S.S.W. ½ W. 2½ cables from the rock on which she struck with the head of her lower mast 3 feet below the surface at low water springs.

Hart Rock, with 4½ fathoms on it at low water, and 7 cables eastward of East point, lies with the North point of Namoa N. 39° W., and the West end of Ruff rock just open of Dome island.†

TIDES.—It is high water, full and change, in Clipper road, Namoa island, at 11h. 15m., springs rise about 7 feet. The streams on the north side of the island run parallel to it at the rate of 1 to 3 knots ; in the neighbourhood of Nangaou bay they are not so strong as at the western end of the island, where they run 4 knots at springs, the ebb coming from eastward. The flood tide comes in both on the north and south sides of the island.

The Coast to the north of Namoa is described on pages 183 and 184.

LAMOCK ISLANDS are a group of four islets, and two patches of rocks occupying an extent of 7½ miles in a N.E. and S.W. direction.

* Examined by boats of H.M.S. *Nassau*, 1877.

† Captain Thomas E. Cocker, of the Imp. Chinese cruizer *Ling Feng*.

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From the Boat rocks at their south-west end, the west point of Namoa bears N.W. ½ W. 22 miles; and from North rock at their north-east end, the east point bears N.W. 13½ miles, and the south-eastern Brother N.E. by E. 25¼ miles.

Boat rocks are two square rocks, 15 feet above high water, about the size of boats, with several reefs between them; they lie W. by N. ½ N. and E. by S. ½ S. from each other The west extreme of East Lamock touching east extreme of High Lamock bearing N.N.E. ½ E. leads one mile to the south-east.*

White rock, lying N.E. 1½ miles from Boat rocks, is sufficiently large to afford shelter to boats.

High Lamock, near the centre of the group, is covered with brush-wood. The channel between it and White rock is safe, the depths varying from 8 to 14 fathoms. The distance between High and East Lamock islands is nearly a mile. "Off the S.W. point of the latter, rocks extend for ½ a mile, blocking up the northern part of the channel. High Lamock may be rounded close to the northward."† The three northern islets lie close together; North rock, the northern one, which has a pyramid on it, is without vegetation.

LIGHTS.—On High Lamock island there are exhibited two fixed lights, viz.:—a high white light, and a low red light.

High Light is a *fixed* white light, elevated 241 feet above the sea, and in clear weather should be seen from a distance of 22 miles. The illuminating apparatus is dioptric, of the first order. The lantern is on a round tower of cast iron, 25 feet in height (lantern vane 54 feet above base), and painted black; the dwellings and boundary wall are white.

Fog Signals.—In thick or foggy weather, when a vessel is known to be in the vicinity, three guns will be fired with *two* minutes interval between them, to be repeated, if necessary, after a further interval of *twelve* minutes.

Low Light is a *fixed red* light, elevated 55 feet above the level of the sea, and in clear weather should be seen from a distance of 7 miles. The illuminating apparatus is dioptric, of the fourth order. The light is exhibited from a window in a white building erected on the southern slope of the island, is visible only between the bearings N.E. by N. and N.E. ½ E., covering the White and Boat rocks, and is intended as a guide for clearing these rocks.

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* Information by Captain E. M. Edmond, P. and O. steam ship *Malacca*, 1877.

† Remarks of Captain R. H. Napier, R.N., H.M.S. *Nassau*, 1877.

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TIMES ROCK, on which several vessels have struck, is a dangerous pinnacle with only 9 feet at low water, and deep water close around. From it, the North rock of the Lamock islands, bears S.W. ¾ S, distant nearly 1¼ miles, and Dome island W. by N. ½ N., 12 miles.

When on the rock, the eastern bluff of East Lamock island is just in sight to the westward of the western apex of North rock, the extremes of the island subtending an angle of 13° 11′.

High Lamock island, open to the north-west of East Lamock island, clears the rock on its north-west side; and when open to the south-east, clears the rock on its south-east side. To pass outside, or to the north-east of this danger, the angle subtended by the Lamock islands, should not exceed 10°, when High Lamock is shut in.*

TIDES.—In the month of April, with High Lamock island bearing E. ½ S. 17 miles, the tides made as follows; first hour of ebb S.W. ½ W. 1½ knots; second hour, S.W. by S. 1½ knots; third hour, S.W. by S. 1½ knots; fourth hour, S.S.W. half a knot. Flood, first hour, N.E. by E. one knot; second hour, E.N.E. 1½ knots; third hour, E.N.E. 1½ knots; fourth hour, E.N.E. 1½ knots; and the fifth hour, E.S.E. half a knot. And in September, with High Lamock bearing E. by N. 4 miles:—The ebb, first hour, S. by E. half a knot; second hour, S. by W. one knot; third hour, S.S.W. one knot; and the fourth hour, S.S.W. 1½ knots. The flood ran to the N.E. the whole tide, the total amount being 10½ knots.

Thus in passing inside the Lamock islands, attention to the tide as well as to the vessel's course is necessary.

LAMON ROCKS.—Between Namoa and Lamock islands are several islets, the northernmost of which is the highest, and from its appearance is called Dome island. The two southern islets, Ruff rock and Oeste rock, lie east and west of each other; to the southward of the Ruff are the Dot and Sul rocks. A reef extends one-third of a mile southward of the Sul; the east end of the Oeste in line with the east end of Plat island bearing N.W., leads to the southward. Plat island is flat topped, and is lower than the Ruff or the Oeste.

MACKINNON ROCK, on which the *Ellen Rodger* struck in 1862, is a dangerous pinnacle, which sometimes breaks, having only 5 feet on it at low water. From the rock the north-west point of Plat island bears W.S.W., distant three-quarters of a mile; the east extremity of Oeste rock, S. by E. ¼ E., 1¼ miles; the summit of Ruff rock, S.E. ½ E., 2 miles; and the summit of Dome island, N.E. by E. ¾ E.

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* Edition of 1874. The examination made by H.M.S. *Nassau* in 1877, placed the rock 1¼ cables N. 11° E. from the position here assigned to it.—Captain R. H. Napier, R.N.

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DIRECTIONS.—To avoid this danger, vessels entering the channel from the westward, should not bring Plat island to the westward of S.W. by S., whilst Dome island is to the northward of an E. by N. bearing; when Oeste rock bears S. by W., they will be to the eastward of Mackinnon rock, and can haul to the northward.

Entering the channel from the eastward, after passing Dome island, steer to the northward until it bears E. by N., and keep it on that bearing until Plat island bears S.W. by S.

SINTA ROCK,* with only 2 feet over it, lies S.E. $\frac{3}{4}$ S., nearly 5 miles from Dome islet, with the south-west extreme of Ruff rock in line with summit of Plat island, bearing W.N.W.; East point of Namoa N. by W.; and the highest part of High Lamock E. by S. $\frac{3}{4}$ S.

YENG ROCK†, awash at low water, is 5 miles N. $\frac{3}{4}$ E. from Sinta rock, with the north end of Crab islet in one with the south-west extreme of Namoa, bearing W. by N., northerly; Dome islet W. by S. $\frac{1}{4}$ S.; High Lamock S.E. $\frac{3}{4}$ S., and East point of Namoa N.N.W. $\frac{1}{2}$ W. The north point of Namoa seen clear of East point, leads north-eastward.

HALF-TIDE REEF.—There is another patch of rocks which show at half tide, between Dome islet and Namoa, bearing from the former, from N. by E. to N.N.E. $\frac{1}{2}$ E. distant one mile. They lie rather more than a mile from the Namoa shore, S.E. by S. from Three Chimney bluff.

CHELSIEU ROCKS, four in number and about 10 feet above high water, bear East nearly $6\frac{1}{2}$ miles from the north point of Namoa. When seen from the eastward they appear as large boulders lying considerably apart.

DIOYU REEF, lat. 23° $31\frac{1}{2}'$ N., long. 117° $12\frac{1}{3}'$ E., is rather more than 3 miles N.W. by N. from Chelsieu rocks; but should high tides and smooth water prevent its being seen, the south end of Pagoda island in Nangaou bay, in line with Saddle peak on Namoa, bearing S.W. by W. $\frac{1}{4}$ W., will lead northward of it. It consists of several rocks (some heads

* The Sinta rock was found by H.M.S. *Nassau* (1877), to be one cable west of its hitherto assigned position; soundings of 9, 7, 10, and 11 fathoms were obtained close around, among casts of 13 and 14 fathoms, indicating a rocky patch culminating in a pinnacle.

† The positions of the Yeng, Lamon, and Mackinnon rocks, Lamocks Lighthouse, Dome island, and half-tide reef were verified by H.M.S. *Nassau* in 1877. Yeng and Mackinnon rocks and half-tide reef were seen breaking. The positions of the Lamon rocks, Lamock islands, and, indeed, all the offlying islands to the S.E. of Namoa, appeared, however, from the cursory examination made by the *Nassau*, to be slightly in error, with reference to Namon island, though *not* with the main.—*Ibid.*

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of which are just awash at high water) in the shape of a horse-shoe, which is open to the eastward. The reef is about 120 yards long, and has a breadth externally of 100 yards: the inner water has a breadth of 50 yards, and forms to all appearance a natural dock. There is apparently deep water close to the reef.*

CHALLUM BAY is fronted by the north side of Namoa; and as before stated in page 179, its entrance affords better shelter during the N.E. monsoon than Nangaou bay, and it is also a good anchorage when the wind blows strong from East or E.S.E. Supplies of wood and water are easily obtainable from the villages round the bay, and fish and wild fowl are abundant.

To enter this bay, pass within a quarter of a mile eastward of Middle islet, a barren rock, as shoal water (11 feet) extends 9 cables from Fort head. The anchorage is between this islet and Entrance island in 6 to 3 fathoms; the bay north of Entrance island is shoal. When running in, steer for the East point of Entrance island, and beware of the starboard shore, as the water shoals suddenly on that side, and there is a sand bank which shows at low water, lying nearly half a mile southward of the west end of Challum island. Under Fort head is a rock nearly covered at high tide, and also one in the bay between it and Difficult point to the north-east; otherwise the coast line here is steep-to.

DIFFICULT ISLET, 110 feet above the sea, lies nearly 3 miles N.E. by E. $\frac{1}{2}$ E. of Fort head. On the highest part of the hills over Difficult point (the point west of the islet) is a square fort.

TERNATE ROCK, with only one foot water on it, lies E. by N. $1\frac{1}{4}$ miles from the summit of Difficult islet, which will then be in line with the third and last sandy hill on the northern part of the range extending from Fort head. Namoa peak in line with Pagoda island, in Nangaou bay, S.S.W. $\frac{3}{4}$ W., leads close eastward of it.

SHALLOW BAY.—E.N.E. $6\frac{1}{2}$ miles from Difficult point is the entrance to a shallow bay with a pagoda on an island within it. The boundary line of the two provinces, Fu-kyen and Kwang-tung, passes through this bay.

CHAUAN BAY, the entrance to which is 10 miles N.E. $\frac{1}{3}$ E. from the north point of Namoa, may be useful during the southerly monsoon; but in N.E. monsoon it runs far enough back to the north-east to allow an awkward sea to arise, and a vessel should then endeavour to

* From information by Mr. P. Edmond commanding the P. & O. Company's steam ship *Orissa*, 1875. Probably showing about one hour before high water.—Captain R. H. Napier.

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reach Owick bay. At the entrance* is a middle ground of 2½ and 3 fathoms water, the south end of which bears W. by N. from Chauan head, and the west end S. by E.; and the east end S. by E. ¾ E., from the pagoda in Shallow bay. On the eastern side of the entrance is Quadra island having at 3 cables from its south-west point a reef awash at low water: when on the reef, Chauan head bears S.E. by E. ⅓ E., and the west end of Quadra, N.E. by N. Shoal water, which may be detected by its colour, extends upwards of a mile from the north-west side of the bay.

Anchorage in 6 fathoms water will be found with the centre of Quadra island bearing S.E.; and farther up the bay in 3 fathoms, with the south end of High island in line with Chauan head. Between High and Quadra islands, and between High island and Chauan head, the channels are too narrow for square-rigged vessels. For Tides, *see* p. 194.

OWICK BAY, 2 miles eastward of Chauan head, is protected to the eastward by a narrow isthmus, having two rocks off its south extreme. Vessels seeking shelter from northerly winds will find smooth water in 3½ fathoms, when the extremes of these rocks bear S.E. Immediately eastward of this bay is a remarkable sand patch, which will help to point out its position.† It should not be entered during the typhoon months as the anchorage is unsafe with S.W. winds. The bottom is of mud.‡

JOKAKO POINT, is 3⅔ miles E. by N. ¼ N. from Owick point. Jokako peak, 880 feet above the sea, and conical shaped, is the highest part of the land at the back of Owick bay.

Bell island, lying 1 mile south-westward of Jokako point, is about 300 feet high, it is perforated at its south end, which will be seen on a S.E. or N.W. bearing. There is an islet between it and Jokako point, about 250 feet high, having a reef off its northern end, which contracts the channel between it and the land to half a mile, and in the middle the depth is only 2½ fathoms§.

Cliff and Square islets.—Jokako point is an isolated hill 640 feet above the sea: off it are two islets; the nearest, Cliff islet, bearing S.E. by E. one mile, and the other, Square islet, E.N.E. 1¾ miles. Square

* Lieut. Morant, R.N., 1865, stated that "a vessel should not attempt to cross the bar at less than half tide, when at the deepest part she would have 12 to 14 feet."

† *See* Admiralty Chart:—East Coast of China, Sheet 3, No. 1,963.

‡ Vessels coming to in this bay after dark should not anchor in less than 5 fathoms as the distance from the land is very deceptive. Lamock light should be seen from the anchorage.

§ Proceeding northward from the anchorage in Owick bay during the adverse monsoon the Bell island channel may be used with safety by small vessels. By hugging the coast not less than 3 fathoms water will be met with. Off Jokako point (which should be passed at a distance of about a ¼ of a mile) chow water is abundant.—*Ibid.*

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islet is perforated. A reef extends a cable N.N.W. from Cliff islet, otherwise the channel between these two islets and the point is safe.

Cone peak, elevated 800 feet above the sea, with a peaked rock off its eastern point, bears N.N.E. ¼ E. 5½ miles from Jokako point; the land between is a sandy plain very little above high water level, across which to Chauan bay the distance is only 2¼ miles.

The BROTHERS are two islets lying S.E. about 12 miles from Tonsang harbour. They are 80 and 150 feet in height, and 1½ miles apart in a S.E. ½ E. and N.W. ½ W. direction. The south-eastern islet (the larger and higher of the two) has a fine bluff at its south extreme, and a reef extending north-westward from it; the smaller islet has a remarkable square top. The channel between the islets has depths of 19 to 21 fathoms and is clear, with the exception of the reef before mentioned.

TONGSANG HARBOUR is one of the best on this coast, and its position will be readily recognised by Fall peak, a remarkable peak, 930 feet above the sea, which rises on its eastern shore and makes something like a saddle, but with a deeper indention; upon the island at the entrance is a pagoda which bears from the south-east Brother, N.W. by N. 14¼ miles. A mud bank, of 3¾ fathoms water, lies outside the entrance, with the pagoda bearing N.W. ½ N. and Fall peak N.E. ¾ N.; but by keeping the Sisters (two islets in the northern portion of the harbour) well open of the east end of Middle island (the island north-east of Pagoda island), a vessel will pass eastward of the bank.*

Pagoda island and the eastern shore of the harbour are steep-to, until the low isthmus is opened which connects Thunder head with Fall peak; the eastern shore then becomes shoal, and the larger Sister must not be brought westward of N. by W. ½ W. Rocks extend 1½ cables from the south point of Middle island, and a mud bank projects northward half a cable from its east point.

H.M. brig *Plover* when surveying this harbour, first anchored in 4½ fathoms under a long sandy point, with Fall peak bearing E. by N. ½ N., and the larger Sister N. by W. ¾ W. Afterwards, for the convenience of obtaining water, which was readily procured (though in the dry season), the vessel was moved to the southward under Thunder head, with Fall peak bearing N.E. and the east end of Middle island N.W. ⅔ W. Thunder head by the Chinese is called Kau-li-tau-shan, which means High Fair Head hill.

Junks anchoring for the tide bring up between Pagoda and Middle islands, but in running for this anchorage take care to avoid the rocks

* *See* Admiralty Plan of Tongsang harbour and Hutau bay, No. 1,958; scale, $m = 1$ inch.

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which extend south-eastward 2 cables from the east point of the northern portion of Pagoda island. The best berth is in 12 fathoms, with the Sisters seen through the opening in the Middle islands; but these islands must not be closed nearer than 2 cables, as a mud band extends from them in a southerly direction. This anchorage, although confined, will be found handy for a disabled vessel in case the ebb tide should prevent her reaching the other, and she will be nearer the town of Tongyung, where spars can be obtained.

The walled town of Tongyung stands on a peninsula on the western shore of the entrance abreast Pagoda island, and although the channel between it and the island is 3 cables wide, it is not a convenient one to enter by, as rocks extend from both shores. Tongsang basin runs back N.N.W. 11 miles from the Middle islands, and there is said to be a river at its head; 3 fathoms water were obtained at the highest point reached, but the channel was very narrow. On the western side of the basin is a boat passage leading into Chauan bay, the entrance to which bears West from Fall peak. In the north-west portion of the basin is a range of high mountains, remarkable for their rugged appearance.

The inhabitants of and about Thunder head will bring off supplies of bullocks, poultry, fish, and vegetables.

CAUTION.—When running into Tongsang harbour, sail should be reduced in time, if the wind is fresh outside, for violent squalls come down from Thunder head.

When proceeding eastward, the coast on the eastern side of Thunder head must not be approached within a cable, as there are some rocks along it; the south face of the head, however, is steep-to.

REES ROCK, which breaks in smooth water at about ½ ebb, is covered at high water springs, it lies S.E. by E. ¾ E. rather more than 1½ miles from Fall peak. East rock, on which the sea breaks at low water, lies a cable eastward of it.

Pass islets peaked, and about 90 feet high, bear N. ¾ E. 1⅓ miles from Rees rock, and the ground between them and the rock being foul with shoal water, should not be approached. Junks use a channel 2 cables wide between Pass islets and the main, which is safe and deep, but requires great caution in steering on account of the chow water.*†

Rees point makes from the southward long and sandy, terminating in a rocky mound about 70 feet high.

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* *See* enlarged Admiralty Plan of Rees pass; scale, $m=2$ inches, on Sheet 4, East Coast of China.

† H.M.S. *Nassau* used this channel in 1877.

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REES PASS is between Pass islets and Rees islands, and on its eastern side, 3 cables from the shore of Chimney island, is a shoal of two fathoms water. Rees islands are barren, and only inhabited by fishermen.

H.M. brig *Plover* rode out a heavy gale veering from N.E. to E. by N., in this pass; she anchored in 6 fathoms, 2 cables westward of the black rock at the southern end of the sandy bay. There is also anchorage under South-east island in 6 fathoms, with its south point bearing East.* In the northerly monsoon smoother water will be obtained by going through the Pass, and following the trend of Hutan bay, keeping as close to the shore as prudence permits. For Tides, *see* p. 194.

Simplicia Wreck rocks are 6 cables N.E. of South-east island, and at their eastern end are several rugged rocks, on the outermost of which the ship *Simplicia* went to pieces, in 1844, having struck upon a reef, which shows at low water, lying a cable north-east of the outer rock.

CAUTION.—In the neighbourhood of the Rees islands the sea rises rapidly after the commencement of a breeze, and overtops, leading to the supposition that there must be some change in the soundings.

DANSBORG ISLAND, 156 feet high, lying 2 miles N.E. of Simplicia Wreck rocks, is 6 cables long, N.E. and S.W., a quarter of a mile wide, and on it are three peaks of nearly equal heights.†

Skead islet is $1\frac{1}{3}$ miles W.N.W. of this island, and between them, at 4 cables from the islet, is a small islet with a reef extending from its west point; a reef also projects from the East point of Skead islet.

CHING ROCK, which covers at half tide, is the highest head of a reef, of some extent, the north-eastern rocks of which break only at low water, and extend two cables eastward of its highest part. It lies N. by W. $\frac{1}{4}$ W. $1\frac{4}{10}$ miles from Skead islet, and from it the north-east peak of Dansborg bears S.E. $\frac{1}{2}$ E.; Awoota rock, W. by S. $\frac{1}{2}$ S.; and Black head, N. by E. The eastern Simplicia, open east of Skead islet, leads eastward of the reef.

GOO ROCK covers at a quarter flood. It lies 2 miles S.W. by W. $\frac{1}{3}$ W. of the Ching, Awoota rock bearing W. $\frac{3}{4}$ S.; the summit of Simplicia Wreck rocks, S.E. $\frac{7}{8}$ S.; and Skead islet, E. $\frac{3}{4}$ S.

Flying Fish Rock‡ lies with the following bearings:—Skead islet S.E. $\frac{7}{8}$ E., High Islet summit S. $\frac{7}{8}$ W., and Awoota (or Awoolā) rock

* This anchorage is hardly commendable as there is a very heavy Tide rip at the entrance which would appear to a stranger as very shoal water.—Sub-Lieut. Anson, R.N., 1875.

† To the north and north-west of the island the water is shoal, there is landing on the S.E. side, but it is difficult.—Captain R. H. Napier, R.N.

‡ Reported by Captain J. Maclear, R.N., of H.M.S. *Flying Fish*, 1884.

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W. by S. ½ S. This rock, which covers at a quarter flood, has from 5 to 8 fathoms close around it.

Awoota rock is close to the main, N.W. by W. ½ W. 2 miles from the north point of Chimney island.

HU-TAU-SHAN, or BLACK HEAD, 5½ miles northward of Dansborg island, comprises five separate hills, the southern of which, Black head, is the most remarkable. The hills are smooth and round, with sandy valleys between. On the northern hill is a walled town. There is good anchorage south-westward of Black head, but not much shelter unless the wind be well to the northward.

Hu-tau-shan river, disembogues on the western side of the head; there is deep water inside its entrance, but is not available for navigation without being buoyed, as the channels, besides being narrow and intricate, are liable to continual change.

A spit runs 3 miles in a westerly direction from Black head, some parts drying at low water; its eastern edge bears W.S.W. from the head.

ANCHORAGE.—Vessels might ride out a strong breeze in 4 fathoms water at the distance of 3 cables from the shore, under Black head, particularly if the wind holds to the northward; but should a gale come on, or the wind draw round to the eastward, the sooner this anchorage is quitted the better. Under these circumstances refuge will then be found by running through Rees pass and anchoring close under Chimney island, or in Tongsang harbour.

The COAST from Black head to Red bay, 10 miles to the north-east, is chiefly low and sandy.

Tagau point, 1¾ miles E.N.E. from Black head, is fronted by a reef of rocks that extend eastward for six cables.

Anchorage.—Though a heavy swell rolls round Hut island (as is indeed the case, more or less at all the anchorages on the exposed part of the China coast between Hong-Kong and Amoy) fair shelter may be obtained in from 4 to 6 fathoms (sand) south of Tagau point so long as the wind holds to the northward of E.N.E. H.M.S. *Nassau* anchored in 1877, with the fort* bearing N. by W., and Hut island E. by N. ¾ N., in 5 fathoms (sand).

Hut islet, is situated half a mile east of Tagau point, north side of Hutau bay, the space between being occupied by rocky ledges, portions of which are always uncovered.

Tagau rock, with 3 feet water and 7 to 9 fathoms close around, lies S.S.W., 3 cables from Hut islet.

* *See* Admiralty Chart No 811; anchorages on the coast of China.

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Two boulder point lies 1 mile N. by W. of Tagau point, and may be known by its *red* sand hills.

Town hill.—At about 1 mile to the west of Two boulder point is Town hill, 312 feet high; it has a green appearance, and on it are several trees, and a walled town, only portions of the wall being visible from seaward.

Baker rock, with 3 feet water, lies N.E. by E. ¾ E. little more than one mile from Hut islet. From the centre of this rock Spire islet bears N.N.E. ¼ E., and Knob rock E. by S.

Spire islets, are four small islets surrounded by rocky ledges, lying 2 miles north-east from Hut islet. Spire islet the easternmost has a square column 69 feet high, and is connected by a ledge, with an islet 35 feet high at three-quarters of a cable north-west of it; the northernmost of the spire islets, 35 feet high, (having rocks above water a short distance north-west,) lies nearly 3 cables from Spire islet; and the westernmost islet 45 feet high lies 2½ cables from Spire islet.

Knob rock, 60 feet high, (with a boulder perched on its summit,) lies S.E. by E. ½ E., little more than 3¼ miles from Spire islet. Latitude 23° 55′ 20″ N., longitude 117° 51′ 38″ E.

Crab point, situated 3 miles N.N.E. ½ E. from Tagau point, is a remarkable headland having several peaks, the highest being 236 feet high; near the western extremity of Crab point there is a large boulder. At three-quarters of a cable south of this point lie two rocks which dry 6 feet at low water; and at three cables to the southward of the boulder lies a rock which dries 13 feet at low water, having around it several sunken rocks. On the beach, 1¾ miles north of Crab point are two rocks, each about 10 feet high.

Cleft islet, 54 feet high, lies nearly 1¼ miles N. by E. from Spire islet, and 6½ cables east of Crab point; at half a cable north of Cleft islet lies another small islet, having in the channel between, numerous sunken rocks.

Cleft rocks lie 3 cables northward of Cleft islet, the southern rock has one foot water, and the northern is awash at low water.

Knob rock in line with Cleft islet bearing S.E. leads southward, and Crab point in line with Town hill (312 feet high, with several trees and a walled town) S.W. by W. leads northward of Cleft rocks.

Outer Cleft islet, 6 feet high, lies 4½ cables E. ½ N. from Cleft islet; between these islets there is an even depth of about 8 fathoms.

Thomson rock, with 18 feet water, lies N. by E. ½ E., half a mile from Outer Cleft islet. From the centre of this rock Knob rock bears S.E. by S. and Spire islet S.S.W. ½ W.

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Pass rock, with 6 feet water, lies N.E. ¾ N., little more than one mile from Crab point, and N.N.W. ¼ W. nearly 1¼ miles from Outer Cleft islet.

Sand hill.—At 2½ miles N. 13° E. of Crab point is a remarkable sand hill (peaked), 7 cables to the eastward of which is Black point, dark, table-topped, and rugged.

BLAKENEY PASS, situated between the outlying islets and rocks, and the coast immediately north of Hutau bay, is a desirable passage for vessels of small steam power bound northward during the adverse monsoon.

Directions.—Vessels from the southward, or from Tagau point anchorage, should pass half a mile south of Hut islet, to avoid Tagau rock, and when Sand hill (peak) is in line with Crab point bearing N. by E. ¼ E. steer with this mark on, until Spire islet and Knob rock are in line S.E. by E. ½ E.; thence a course may be steered to pass between Crab point and Cleft islet, borrowing well towards Crab point to avoid Cleft rocks, and when Crab point is in line with Town hill, S.W. by W., steer N.E. by E. midway between Thomson and Pass rocks. This track will lead over a bank with 21 feet water, lying between Hut and Spire islets; after passing Hut islet, by keeping about 3 cables to the westward of the track until abreast Spire islet, not less than 7 fathoms will be obtained.

Tides.—It is high water, full and change, at Knob rock at 11h. 20m.; springs rise 14 feet; at Hut island at 0h. 20m.; springs rise 14 feet.

RED BAY will be found a fair roadstead in the N.E. monsoon, and may be readily recognized by two high Black rocks off its eastern point, as well as by the low red sand hills behind it. A reef, having 3 fathoms close-to, extends north-westward from the southern of the two rocks, leaving a passage for small boats between it and the main at low tide. N.W. by W. 7 cables from the southern Black rock is a reef, covered at high water. The water shoals gradually after passing Black rocks, and anchorage may be taken where convenient. At the head of the bay is a village on the right bank of a creek, the entrance to which is dry at low water.* For Tides, *see* p. 195.

DIRECTIONS.—Working up to Red bay from the southward, take care to avoid Shun reef, lying East 6 cables from a low hill on the shore, and nearly 3 miles S.W. by W. ½ W. from the eastern Black rock. By

* *See* enlarged Admiralty Plan of Red bay, scale, $m = 1$ inch, on Sheet 4, East Coast of China.

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tacking when Black rocks are in one with the point off which they lie, a vessel will be a third of a mile eastward of the danger.

In navigating this portion of the coast during the N.E. monsoon, the wind will be found to hang to the northward from 2h. to 10h. a.m. and in the eastern quarter the remaining period. Deeply laden vessels will find it more advantageous to seek shelter in one of the harbours or roadsteads above mentioned during a strong N.E. wind, than to keep underway, as ground can seldom be gained in consequence of the depth of water.

CORK POINT to CHIN-HA POINT.—The coast line from Cork point, the north-east point of Red bay, takes a N.E. ½ N. direction 18½ miles to Chin-ha point. From Cork point a reef extends half a mile. Halfway between Cork and Chin-ha points is House hill point, fronting the south and east sides of which is a ledge of rocks, dry at low water, and extending a cable from the shore, and at a little more than a mile to the northward are two remarkable pointed sand hills, 300 to 400 feet high, bearing from each other N. ¾ W. and S. ¾ E. These hills bear from Notch island W. ½ N. about 1¼ miles.

From House hill point a dangerous reef of rocks extends three-quarters of a mile in a S.S.W. direction, and at low water shows as three distinct patches of dry rocks, the northern of which is awash at high water. House hill point is the southern extremity of a small islet connected with House hill at low water. House hill is low, with the ruin of a house on its summit, and bears N.W. by W. ½ W. from Lamtia island.

A shallow inlet called by the natives Chung-chou runs some distance inside House hill, across the entrance of which is a bank of sand dry in places at low water.*

LAMTIA AND NOTCH ISLANDS.—Lamtia island about 170 feet high bearing N.E., distant 9 miles from Cork point, is of basaltic formation, and its southern side rises abruptly from the sea; a reef extends N.W. by N. half a mile from it. Notch island, of similar formation, but steeper and squarer at its summit, is about 300 feet high; it lies N. by W. 3 miles from Lamtia, and has a rocky spur extending S. by E. a quarter of a

* There are two small inlets here, Kangkow and Chu or Clue bay. Both have bars across the entrance, and are much frequented by pirates, as from their proximity to Amoy they can easily dispose of their plunder. A gunboat can get into Kankow at the top of high water, but will ground inside at half tide. In Chu bay there is deep water above some fishing stakes, but there is not more than 12 feet over the bar at high water; it is a safe but confined anchorage. The passage of these bars ought not to be attempted without a local pilot.—Lieut. and Com. Geo. Digby Morant, R.N., H.M.S. *Grasshopper*, 1865.

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mile from it, and also one N.W. by W. 3¼ cables. Shelter may be obtained for the night during the N.E. monsoon under the lee of Notch island.

CHAPEL ISLAND, in lat. 24° 10′ 18″ N., long. 118° 13½′ E., is about 180 feet high, 47 miles N.E. ⅔ N. from the south-east Brother, and 11¼ miles S.S.E. from the Chauchat rocks at the entrance of Amoy. It is merely an egg shaped rock surrounded by deep water ;* of basaltic formation, with steep sides and grassy top, and perforated at its southern end; there is also a remarkable mound on either end. Two tanks have been built on the island to catch rain, the island being devoid of water. With this island bearing South, and when about midway between it and the entrance to Amoy, Captain Ross, of the Indian Navy, passed over a sand-bank of 6 fathoms water, but no less could be found. *See* Caution, page 210.

LIGHT.†—A *fixed and flashing* white light, the flashes being shown *every half minute*, is exhibited on Chapel island. It is elevated 227 feet above the level of high water, visible all round, and in clear weather should be seen from a distance of 22 miles. The illuminating apparatus is dioptric, of the first order. The tower, 63 feet high, is round and painted black ; the keeper's dwelling and wall are painted white.

Fog Signals in thick or foggy weather, when a vessel is known to be in vicinity, two guns will be fired at *three* minutes interval between them, to be repeated, if necessary, after a further interval of *ten* minutes.

MEROPE SHOALS are between Chapel island and the coast.

South Merope is crescent shaped and has only 6 feet on its shoalest part. From its southern end, Chapel island summit bears N. 58° E. 7¾ miles, and Lamtia island summit N. 57° W. 4$\frac{4}{10}$ miles, its two horns extending from that position, respectively N. 70° W. 1$\frac{4}{10}$ miles, and N. 12° E. 1½ miles ; and its eastern edge N. 48° E. $\frac{6}{10}$ of a mile. A bank with irregular soundings of from 3½ to 8 fathoms (and possibly shoaler water) extends 1½ miles westward of its western ; and also, 3 miles to the north-eastward of its northern horn. Though the lead gives some warning when nearing the shoal from the northward, it is useless to the southward, there being 9 and 10 fathoms water close to the edge of the reef.‡

When approaching this shoal from the southward do not bring the high land of Cork point to the southward of W. by S., whilst Chapel island is

* Remarks of the late Captain B. W. Bax, R.N. "Cruise of the *Dwarf*."

† Chapel island light is difficult to discern until close in thick weather.—Captain R. H. Napier, R.N.

‡ *Ibid.*

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eastward of N.E. Chin-ha point N. by W., or Nantai Wúshan pagoda N.N.W. will lead eastward of the shoalest part; the mound on Chincha point bearing N.N.E. ¼ E. leads well clear to the westward.

North Merope is formed of pinnacle rocks, the highest of which dries 8 feet at low water; these rocks have deep water between them, and bear W. by N. 8¼ miles from Chapel island; the eastern edge bears N.E. from Lamtia island.

Chapman Patch, situated about 2 miles north-east of Notch island, is a rocky patch having depths of 9 to 15 feet water, with a pinnacle rock of 5 feet water on its eastern edge, from which the patch extends 1½ cables southward, one cable westward, and a quarter of a mile northward. From the pinnacle rock Chapel island lighthouse bears E. by S. ½ S., Chin-ha-point (east extreme) N.E. ½ E., and Lamtia island S. by W. ¼ W.

TINGTAE BAY, 4 miles northward of North Merope, affords fair shelter for small vessels in the N.E. monsoon. Its vicinity may be easily known by a flat stratified table head with three chimneys on it, forming the eastern point of the bay, and the ruins of a walled town on the hill above it. The pagoda of Nantai Wúshan, 1,720 feet above the sea, stands on the hills immediately at the back of this bay. The coast here continues in a north-easterly direction 3 miles farther to Chin-ha point, when it takes a sudden turn to the N.W., forming Amoy harbour.

Shoal.—A rocky patch, a quarter of a mile long in a N. by E. and S. by W. direction, and one-eighth of a mile broad, with 2 fathoms over it; (its southern extreme 2 fathoms) lies in the south-western part of Tingtae bay with the following bearings and distances, viz.:—

Nantai Wúshau pagoda	- -	N. 2° W.
South extreme of Table head	- -	N. 72 E., distant 2 miles.
Notch island summit	- -	S. 41 W., „ $3\frac{1}{10}$ „

CAUTION.—Vessels bound to Amoy from the southward and passing between the off-lying dangers and the coast should use the utmost caution.

TIDES.—It is high water, full and change, at the entrance (page 159) of Chauan bay at 11h. 0m., and springs rise 6½ feet; and at the beach under Fall peak in Tongsang harbour, and at Chimney island in Rees pass, at 11h. 30m., and the rise is 12 feet. The rate of the flood into Tongsang harbour at the springs is three-quarters of a knot.

Off Jokako point, 4 days before the change of moon, the ebb ran 4½ knots in one tide; the two first hours S.W. by W., and the last four S.W.

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In Rees pass on October 25th, with a gale from the N.E., the ebb ran S. by W. in all 12¾ miles; there was no perceptible flood. Also in October, Awoota rock bearing S.W. ½ W. 3 miles, the first hour of flood ran E.N.E. half a knot; second hour, N.E. half a knot; third and fourth hours, N.E. one knot; fifth hour, E.N.E. half a knot; sixth hour, N.E. by E. half a knot. The first hour of ebb ran S.W. half a knot; second hour, S.S.W. half a knot; third hour, S.S.W. one knot; fourth and fifth hours, S.S.W. a quarter of a knot.

Again, with Fall peak bearing W. by N. 7 miles, the first 2 hours flood ran N.N.W. 1½ knots; and the third N.W. by W. one knot. The first hour of ebb ran S.W. by S. one knot; second hour, 2 knots; third hour, S.S.W. 1½ knots; fourth hour, S. by W. 1½ knots; fifth hour, South one knot.

Another observation in Rees pass, the moon's age being 11 days, gave the set of the ebb S.S.W.; last hour, South 1¼ knots: and the flood N.E. at the rate of half a knot per hour; wind N.E. force 7.

At Red bay, in October, the moon being 19 days old, the rise and fall was 11 feet. "Ebb, W. by N. and W.N.W., the whole amount of tide 2½ knots. Flood, first hour, W.S.W. one knot; then E.S.E. during the remainder of the tide, whole amount, 1½ knots. Again with the moon's age 9 days: Ebb north and then N.W. one knot per hour, and the flood E.N.E. half a knot."* These observations show great irregularity of the tides at Red bay.

With Lamtia islet, bearing W.S.W. 7 miles; 6 days after the change in December, the ebb ran W.S.W., then S.W., and for the last three hours S.E.; total amount in the tide, 3¾ knots. The flood ran N.N.E., then North; total amount, 4½ knots.

At Chapel island, at springs in June, the flood set North or N.N.E. 1½ knots per hour. At the time of high water at Amoy it turned and ran S.W. by W. about 2 knots per hour.†

Under Wu-sen island, at the entrance of Amoy, on the fourth day of the moon, the ebb ran S.E. at the rate of 1¼ knots: and the flood N.N.W. at half a knot. Betwen Wu-sen and the main the tides have more strength, and vessels should not attempt to pass.

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* From China Pilot, first edition. It appears that the direction of the tides in the passage here quoted is that *from* which and not *to* which it flows.

† Lieut. Bell, R.N. (Remark book H.M.S. *Encounter*, 1881) observes that when at anchor 2½ miles E.N.E. of Chapel island, the tides were rotary, moon's age 26 days. During the 1st hour following high water at Amoy (inner harbour) the tide turned from N.N.W. through West to S.W.; during the second hour the ebb set S.W.; third hour, S.W. by S.; fourth hour, S.S.W.; fifth hour, South, and sixth hour, S.S.E.

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CHIN-HA POINT.—Banterer reef, a dangerous rocky patch, about a quarter of a mile in diameter, lies N.E. by E. 6½ cables from Chin-ha point, and S. ¼ W. 2¾ miles from the south-east part of Wu-sen island; the highest rock dries 5 feet at low water, and between the reef and Chin-ha point are 5 and 6 fathoms water. Vessels should pass well outside the reef. Notch island, or Table head, just open of Chin-ha point leads to the south-east, and the eastern extreme of Wu-sen island bearing N. ½ W. leads to the eastward of it.

WU-SEN ISLAND, (*or Ngo-seu*) 300 feet high, is on the western side of entrance to Amoy outer harbour. The island is 1¼ miles long, north and south, and near the middle only 2 cables broad. Its north-east and south-east faces are steep cliffs, and on its western side are three sandy bays, and one on the eastern; in the northernmost bay on the western side is a large village and the ruins of an ancient fort.

The opium vessels used to lie between this island and the island of Wu-an to the westward of it, but the anchorage was found too confined, and not so convenient of access as that under Tae-tan island; it will be prudent not to pass westward of Wu-sen, as the channels inside are only partially surveyed.*

A rock, which is sometimes covered, lies between Wu-sen and Chin-ha point, with that point bearing S. ¼ W., and Nantai Wúshan pagoda W.N.W.

The CHAUCHAT are three flat rocks nearly awash at high tide, lying about half a mile eastward of Wu-sen, with the three chimneys on Wu-sen in one with Nantai Wúshan pagoda W. ⅔ S. Should high tides and smooth water prevent their being seen, a vessel will pass eastward of them by keeping Tae-pan point open northward of Tsing-seu N.W. by W. Between these rocks and Wu-sen is a channel, half a mile wide, but in consequence of the chow-chow water there, it will be better to keep to the eastward.

A rocky 8-feet patch lies 4½ cables E. by S. ¼ S. from Chauchat, with the extremes of Wu-sen bearing from S.W. by W. ¼ W. to W.N.W., and the eastern extreme of Tae-tan N. ¼ E.†

The CHIN-TSEAO are two rocks, the eastern of which is 60 feet high, and the other covered at high water, lying N.W. by N. half a mile from the north end of Wu-seu; between them and the main and are several islets and half-tide rocks.

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* *See* Admiralty Plan of Amoy harbour and approaches, No. 1,767, scale, $m = 1$ inch.

† Mr. A. F. Boxer, Master, R.N., H.M.S. *Hesper*, 1862.

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TSING-SEU is a table-topped island lying three-quarters of a mile north-west of the Chin-tseao, and with Chih-seu island 8 cables to the north-east, forms the entrance to Amoy outer harbour; it rises precipitously from the sea, and forts are built upon its summit, which is 250 feet above high water.

At 6 cables north-west of the Chin-tseao and 2 cables southward of Tsing-seu, is a rock, which only shows at very low tides. To the westward of Tsing-seu are many sunken rocks, on one of which the ship *Blundell* struck in 1850; the channel, therefore, between this latter island and the main cannot be considered safe.

LIGHT.—A fixed white and red light is exhibited from the northern slope of Tsing-seu, showing *red* between the bearings of North and N.W. by W. *white* over the entrance and up the harbour between N.W. by W. and S.E. ½ E.; and *red* when bearing from S.E. ½ E. to east. It is elevated 130 feet above the sea; and in clear weather the *white* light should be seen from a distance of 15 miles, the *red* 8 miles. The Light tower (33 feet high) is octagonal and painted with red and white vertical stripes, the keepers dwellings white.

TAE-PAN SHOAL.—The western side of Amoy outer harbour between Tsing-seu and Tae-pan point is shoal with several reefs in it; but they will be avoided when standing westward by keeping the pagoda on Ki-sue island open north-east of Tae-pan point. To avoid the shoals on the north-east side of the harbour, do not bring the east end of Seao-tan to the southward of S.E. by E.

CHIH-SEU is a small islet 60 feet high, lying N.E. ⅓ E. 8 cables from Tsing-seu. Rocks extend in a southerly and an easterly direction half a cable from this islet, which is connected to two other small islets, Hwangkwa and Tao-sao, by a rocky bed which blocks the passage. Foul ground extends N.W. 4 cables from Tao-sao, and terminates in a reef which bears North half a mile from Chih-seu, and W. ½ S. from the north extreme of Seao-tan. A vessel will keep north of this reef, by having the channel open between Seao-tan and Tae-tan.

SEAO-TAN is an island 6½ cables long, east and west, 200 feet high with three chimneys on it, and a sandy bay on its northern side. It lies E.N.E. of Hwangkwa, and the channel between, 3 cables wide, is frequently used; but as foul ground extends to the southward of both islands, and shoal ground runs off 2 cables N.N.W. of the west point of Seao-tan, a heavy or unhandy vessel had better use the channel between Tsing-seu and Chih-seu. On Seao-tan is a signal station which communicates with Amoy.

TAE-TAN ISLAND.—Taetan the highest island of this group, and lying north-east of Seao-tan, is about 8 cables long, N.N.W. and

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S.S.E., with a low sandy isthmus in the centre; the highest part, 300 feet above the sea, is at its east end, which has a small circular watch-house and three chimneys on it; its western end rises to a conical peak, on which is a small circular fort. The channel between this island and Seao-tan is 2 cables wide, but as vessels are likely to have baffling winds, it would not be prudent for a stranger to use it.

The soundings on the bank westward of Tae-tan have much decreased, and a vessel drawing more than 12 feet must wait for water to run through this channel. The rocks to the northward of Tae-tan extend much farther out, and two separate ones are visible at low water springs. Between Tae-tan and Amoy the channel is under 2 fathoms; but, as before noticed, the foul ground on the north-eastern side of Amoy outer harbour will be avoided by not bringing the north end of Seao-tan to the southward of S.E. by E.

Tae-tan (Harbour) **Light,** is described on page 204.

AMOY ISLAND AND HARBOUR.

[VARIATION, 0° 20′ W. in 1884.]

AMOY ISLAND, about 22 miles in circumference, occupies the northern portion of the great bight between Chin-ha and Hu-i-tau points; in the eastern portion is the island of Quemoy and Hu-i-tau bay. The city of Amoy stands on the south-west part of the island, abreast the island of Kulangseu, which affords protection to the inner harbour.

Amoy was captured by the British forces on August 26th 1841, and by the treaty of Nanking, which followed, was thrown open to foreign trade. The harbour is one of the best and most easy of access on the coast of China, so that the services of a pilot, either in entering or departing, are scarcely necessary. There is good holding ground in the outer harbour, and vessels can anchor in the inner harbour, within a short distance of the beach, in perfect security.*

The Chinese city occupies the south-western corner of the island of Amoy near the mouth of the Lung-kiang, which leads westerly to Chang-chau-fu. The population is estimated at about 250,000 and, unlike the turbulent Cantonese, is quiet and inoffensive. There is a seamen's hospital on this side at which the charges are 1½ dollars a day for seamen and 3 dollars for officers.

The British Consulate offices are situated on the east side of Kulang-seu, over Ling-tau point.

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* *See* Admiralty Plan of Amoy inner harbour, No. 1,764 scale, *m* = 6 inches.

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The trade had already become considerable in 1858. In that year 331 British vessels of 99,331 registered tonnage, with goods amounting to 925,944*l.*, entered inwards, and 329 of 97,897 tons, with goods amounting to 699,357*l.* cleared outwards. The articles imported were cotton and woollen manufactures of all kinds, metals, opium, rattans, rice, wheat, peas, stockfish, treasure, wood of all kinds, and mangrove bark, &c., and those exported were alum, building materials, gold leaf, camphor, china ware, kittysols, paper, sugar and sugar candy, tea, tobacco, treasure, rice, wheat, peas, &c. The principal exports were, crockery ware, umbrellas, tea, sugar, sugar-candy, paper, tobacco, camphor, and grass-cloth.

Since that it has been steadily progressive. In 1863, 802 vessels entered the port, registering 278,319 tons, including 265 steamers. Of these, besides the casual arrivals from the various Chinese ports, there are six which form a regular line between Hongkong, Swatow, Amoy, and Fuchau. These steamers almost entirely monopolise the coasting trade and conveyance of treasure, as well as passengers.

The foregoing remarks refer to the year 1874, since which period the number of steamers running to and from Amoy has been annually increasing. In 1882, the number of British vessels entered and cleared was 1,279 of 878,866 registered tonnage and of those of other nations 423 with a tonnage of 196,740, giving a total of 1,782 vessels and 1,115,018 tons. A regular communication now exists (by two steamers) with Manila. The total value of the export trade for the same year, amounted to 1,036,411*l.* and that of the import to 1,864,515*l.**

The south point of Amoy is sandy, with several black rocks extending 2 cables off shore. On the slope of the hill which forms the point is a circular battery; W. $\frac{3}{4}$ N. 7 cables is a second battery, and between the two at 3 cables from the shore, a half tide rock, which will be avoided by a vessel of light draught by tacking before Cliff point, with a battery and three chimneys on it, comes in one with a sandy point with a large stone (Cornwallis Stone) at its south extreme, three-quarters of a mile to the north-west. From Cliff point the three fathoms line of soundings extends 2 cables off shore, otherwise the shore to the westward, which is a continuous sandy beach, is steep-to and the lead a good guide.

From Cornwallis Stone the shore trends rather more to the northward for a quarter of a mile, where there is a creek dry at low water, and at the back of the creek an extensive suburb, and an isolated hill, the summit of which is a large mass of granite. N.W. $\frac{1}{2}$ N. three-quarters of a mile from the Stone are several rocks which cover at half tide, the outermost lying $1\frac{1}{4}$ cables off shore; on the point from which they extend is a mass of

* Commercial reports by H.M. Consuls in China, 1882.

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granite. The city commences at this point and stands very little above the sea level; the houses coming down close to the beach, on which the trading junks lie aground. The ridge of hills upon this face of the island do not rise above 600 feet. They are abrupt and barren, with numerous large boulders of granite, a square upright mass of which, on the highest part of the western extreme of the ridge, rises 308 feet above the sea.

Docks.—The docking accommodation is very good, and ably managed by the Amoy Dock Company. There are three docks. The chief establishment, Amoy Dock, is situated on the Amoy side, nearly abreast Dock islet. The dock is of granite, fitted with a caisson gate and with a centrifugal steam pump of great power, ensuring despatch in all states of the tide. For repairs an ample stock is kept on hand of timber, spars, metal for sheathing and every description of material required for dockyard use. The premises comprise a large smithy and carpenters' workshop, sail lofts, mast sheds, boat houses, and dry godowns for the reception of vessels' stores when requiring to discharge them; and every facility for repairing and sparring vessels, and for cleaning and painting iron and steam ships. There is also a wharf, with 18 feet water alongside at springs, fitted with masting shears. The dock, which is capable of taking a vessel 300 feet long, is 310 feet in length over all and 304 feet on floor; depth from coping to sill 20 feet; length of caisson on deck 64 feet; on floor 54 feet; width of dock at entrance gate 60 feet, on floor 34 feet; there are 18½ feet water at entrance at springs, from August to December (but in April the tide may not allow more than 16 feet). The rise of tide at springs is 18 feet and at neaps 12 feet.

The second dock is on the Kulangseu side, near the Lintau landing place; it is 245 feet over all, 66 feet broad at entrance with a depth over sill of 13 feet at ordinary spring tides. The third and smallest, called the Bellamy dock, is near the entrance of the inner harbour, abreast the Brown rock; it is 185 feet long, 51 feet broad, with 12 feet over sill.*

CAUTION.—Banner rock, a sunken rock, on which there are only 6 feet at low water; lies N.W. ¾ N. 1½ cables from the entrance of Amoy Dock.†

KULANGSEU ISLAND is separated from the south-west shore of Amoy island by a channel from 2 to 3½ cables in breadth and 1½ miles in length, which forms Amoy harbour. Kulangseu is one mile in length, north and south, and the same in breadth, having a circumference of nearly 4 miles. There are two distinct ridges on it. Its highest summit, 302 feet high, when viewed from the entrance of the outer harbour, appears as one

* *Shipping Gazette*, July 1862; also "The Treaty Ports of China and Japan," and British Admiralty record.

† Mr. J Cass, Manager of Amoy Dock, 1865.

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huge boulder. The island is principally of granite, and fresh water from wells is plentiful. The British consular residence standing on the south-east part of the island, on a prominent position, is very conspicuous; and N. by E. one-sixth of a mile therefrom, is the eastern peak, 174 feet high, separated from the highest summit by a valley. On this hill is the signal station.

The signal staff is in latitude 24° 26′ 45·66″ N., and longitude 118° 4′ 3·6″ E.*

Druid head, the western point of the island, has detached low-water rocks at half a cable's distance off it; on the next point north of the head is a small joss house. On the summit of the northern point of the island is a conspicuous stone, called Wellington's Nose; and W. ¼ N. a third of a mile from the Nose, and one cable in the same direction from Modeste point, is First rock, 8 feet above high water.

The northern, eastern, and western sides of the island are studded with numerous rocks, all covered at high tide; twelve of these are marked with perches, having round basket tops painted white; the first three mark northern edges of reefs, off the north end of Kulangsu; the next five are on rocks on the western side of the inner harbour; and the last four (painted *red*) on the eastern side. There is a stone *beacon* painted black on the Alibi rock, 1¾ cables N.E. of its northern extremity. Two stone beacons painted black, mark the eastern edges of two reefs of rocks (Kang-sim-tah and Chiotah).

Extending out from Kulangsu into the inner harbour; and near the southern beacon are two dangers :—†

1. A patch consisting of three pinnacle rocks, the outer of which, with 8 feet over it at low water spring tides, lies with the Southern stone beacon bearing N.W. by W., distant 70 yards.

From this outer rock, Alibi rock beacon is just open north-eastward of the Northern stone beacon, and in line with the west fall of Hauseu (or Monkey) island.

2. A rock, with 14½ feet over it at low water spring tides, lying with the Southern stone beacon bearing S. by W., distant 40 yards.‡

Foul ground extends half a mile from its south-eastern shore, and detached rocks lie off all its points.

Kiu-sung-seu, or Watson island, 199 feet high, lying two-thirds of a mile north-west of Modeste point, is nearly connected to Sung-seu island by low-water rocks. Hauseu, or Monkey island, may be said to be the

* Telegraphic determinations of secondary meridians by Lieutenant Commander Green, United States Navy, 1883.

† Lieutenant and Commander Mc Quhae, H.M.S. *Foxhound*, 1882.

‡ Kang-sim-tah, and Chiotah rocks are in line with the highest pinnacle of Coker rock on a S. 34° E. bearing.

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northern boundary of the harbour. It is 61 feet high. The Chalk islands, the southern of which is about 50 feet high, and bears N.N.W. ¾ W. nearly one mile from Hauseu, are easily distinguished by their white bases; the fourth island, in an N.N.E. direction from the southern, is 125 feet high.

BUOYS.—Coker rocks, the outer dangers at the entrance of the eastern channel into Amoy inner harbour, (the southern of which has 2 feet water on it,) are marked by two iron buoys, the *larger*, (7 feet in diameter, painted *black* and *white* chequered) being moored in 8 fathoms near, and *eastward* of the rocks; and the *smaller* one (6 feet in diameter, *red* and *white* chequered) in 6½ fathoms, near and to the *westward.* From the northern rock the west extreme of Thumb rock is just touching the white staff on the point north of it, N.W. ½ N., and from the southern, the high-water rock (6 feet high) off Beveridge point is just open south of two small rocks of the same height lying off the English consulate nearly West. Coker rocks lie in mid-channel. Vessels should not pass between these buoys.

Brown's rock of 13 feet is marked by *two* buoys, one on its *eastern* side painted in *black* and *white* chequers and surmounted by a *black* cage; and the other on its *western* side painted in *red* and *white* chequers and surmounted by a black cage. Vessels must not pass between these buoys.

Consolation rock.—A pinnacle rock having a depth of 16 feet, on which the British steam vessel *Consolation* struck, has been found to lie about 50 yards eastward of Brown's rock.

Harbour rock lies in the anchorage, having only 9 feet water at low tides, and 6 and 7 fathoms between it and the shore; from the rock the apex of Dock island bears N.E. ¼ N., distant 1½ cables: an iron nun buoy painted red and black chequered, marks its position.*

There is also a sunken rock, conical, and having a depth of 11 feet on it at low water spring tides which bears S. 29° E. distant about 425 feet from High Water rock. To avoid this rock keep Malcampo's house well open westward of high water rock. This rock is out of the track of shipping.†

Kellett spit is the extreme north of the foul ground extending in a northerly direction from the north point of Kulangseu. An iron can buoy with *red* and *black* vertical stripes is placed in 4 fathoms on its northern edge. Vessels should pass to the northward of this buoy. Great caution is needed in rounding Kellett spit on the ebb. It has been the scene of many accidents. The U.S. steamer *Fung Shuey* was lost there in a singular manner whilst shifting berth with a single warp. The flood

* Vessels passing *inside* this buoy should give it a berth of not less than 50 fathoms.

† Chinese notice, No. 175, of 1883, Admiralty plan of Amoy harbour, No. 1,764.

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was running at the time on the north side of the harbour, but the ebb was making on the south side, and drifted her on to the rocks.

Built Pile, originally a stone beacon erected on the rocks fronting Sin-lau-tau point, is now reduced to a heap of ruins. It bears N.N.E. $1\frac{2}{3}$ cables from the signal staff on the hill marked 174 feet.

ANCHORAGE.—The outer harbour of Amoy has extensive anchorage in 7 to 16 fathoms, good holding ground, and unless vessels are badly found it is not probable that any gale could hurt them. The usual anchorage is westward of Cornwallis Stone; a good berth is in about 6 fathoms, muddy bottom, with Cornwallis Stone bearing East, and Thumb rock N.W. $\frac{1}{2}$ N. This is almost as near the town as a vessel can approach without the necessity of mooring.*

Moorings are laid down in the northern part of Amoy harbour for coasting steam vessels, and on the eastern shore for Chinese Imperial gunboats; there are no moorings laid down for H.M. gunboats, but it is customary for them to moor off the eastern shore of Kulangseu island, between Thumb rock and Built pile.

There is also good and safe anchorage in 7 to 17 fathoms in the channel on the west side of Kulangseu.

Typhoons are rarely experienced, but one or two a year generally find their way up the Formosa channel, and along the coast; at such times Amoy is visited by heavy north-easterly gales, with hot winds, veering round east and south. Vessels then in the neighbourhood generally run for the harbour to repair damages.

In August 1864 † two typhoons passed over Amoy in close succession, with bad weather continuing for eleven days without intermission.

TIDES.—It is high water, full and change, in Amoy inner harbour at 12h. 0m., ordinary springs rise $18\frac{1}{2}$ feet, neaps $14\frac{1}{2}$ feet. During the N.E. monsoon, the evening fall is only 15 feet, the previous rise having been 19 feet. This occurs from September till March, when for a short time the morning rise and evening fall may be said to be equal. During the S.W. monsoon this phenomenon is reversed, the evening tide having the greatest fall, the morning the least.‡ The greatest velocity at springs is 4 knots.§

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* The best anchorage for ships of the Iron Duke class is in mid-channel with Cornwallis stone bearing E. by N., Remark book of Captain H. Cleveland, H.M.S. *Iron Duke*, 1879.

† Reported by Ed. Wilds, Esq., R.N., commanding H.M. surveying vessel *Swallow*.

‡ *See* Admiralty Manual, Art. iii., on the Tides.

§ During the 1st hour flood at Amoy the tide turned from S.E. through east to N.E. by E. The 2nd hour's flood ran N.E. by N., 3rd hour N.N.E., fourth hour North.

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Owing to a greater rise of tide from August till December than the other months of the year, a vessel may be taken into Amoy dock drawing 18½ feet. In April there are only 16 feet on the blocks, which is the lowest during the year. It gradually falls to this level from December and again increases to the month of August.

HARBOUR LIGHT.—There is a white, octagonal lighthouse, 16 feet high and about 300 feet above the sea, on Tae-tan island, fitted with Argand lamps, and exhibiting a *fixed* light, seen 10 miles in clear weather, but the light is (from its height) faint in comparison with that of Tsing-seu, and difficult to discern. The light is visible when bearing from West round by North to S.E.

DIRECTIONS.* — When bound to Amoy from the southward, after rounding the Lamock islands and the Brothers, steer about N.E. by N. for Chapel island, keeping between 10 and 12 miles off the coast to avoid South Merope shoal. The Nantai Wúshan pagoda is a good landmark by which the entrance of Amoy may be recognised when in the neighbourhood of Chapel island, which may be passed close to on either side, thence a N. by W. ½ W. course will lead towards the entrance of the harbour. As the 8-feet patch off the Chauchat rocks is approached keep Tae-pan point well open north of Tsing-seu to pass eastward of it; thence steer between Tsing-seu and Chih-seu into Amoy outer harbour.

Approaching Amoy harbour from the eastward Dodd island should be given a berth of 1½ miles to avoid a 14-foot patch on which the sea breaks occasionally, lying 1¼ miles east of the island. Leeo-lu head should be passed at half a mile distant or not in a less depth than 5 fathoms. Nantai Wushan pagoda in line with the north summit of Wu-sen island, bearing W. ¾ S., is a better mark for leading south of Quemoy spit than that formerly used, namely, Ki-sieu island, open south of Tae-tan island, as Ki-sieu can seldom be seen from abreast Quemoy spit, except during very favourable weather. Leeo-lu hill in line with the south-west point of Quemoy island, bearing N.E. ¼ E., leads east of Quemoy spit.† From thence steer for Tsing-seu, keeping Tae-tan point well open north of Tsing-seu as before.

5th hour N.W., and the 6th hour N.N.W. The strength of the tide at the 3rd hour was 1½ knots per hour. The tides rotated similarly off the entrance to the harbour.—Remark book of Lieut. L. K. Bell, H.M.S. *Encounter*. 1881.

* Chiefly from the Remarks of George Stanley, Master, R.N., and Assistant Surveyor.

† Quemoy spit appears to be extending to the S.S.E. 4¼ fathoms will now be obtained on a line with Ki-sieu pagoda just showing south of Tae-tan island. The pagoda, therefore, should not be shut in.—Lieutenant Carpenter, R.N., H.M.S. *Magpie*. 1882.

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The entrance to Amoy in clear weather is easily distinguished by the high land on the South side, on the summit of which is the Nan-tai pagoda, an excellent landmark, but often covered with clouds, especially in the south-west monsoon. After Chapel island is made the six islands forming the outer harbour soon come in sight.

The channel into the inner harbour, between Kulangseu and Amoy, is so narrow, and sunken rocks lie off both its shores, that a stranger should not attempt it without a pilot. The best anchorage is between Dock islet off the city point and Hauseu island. The inner harbour, however, may be reached without difficulty by passing through the channel westward of Kulangseu, taking care to give Druid head, the south-west point of the island, a berth of at least one cable length, and recollecting that shoal water extends half a mile from the mainland on the opposite shore. After passing Druid head keep well over towards Watson and Hauseu islands, and in crossing over to the eastward for the city beware of Kellett spit extending from the north point of Kulangseu, especially if the ebb tide is running strong.

Pilots.—Chinese pilots are generally to be met with inside Chapel island who are licensed to pilot vessels as far as Cornwallis Stone, the limit of the inner harbour, whence European pilots take charge. Their boats may be recognised by their carrying a flag and having "Licensed Pilot" painted on the bows.*

Entering the harbour.—It is always advisable to enter the eastern or Blonde channel into Amoy harbour on the ebb. In entering steer for Cornwallis Stone, and after passing it keep the Amoy shore abroad on the ebb and during the N.E. monsoon. The Coker and Brown's rock buoys watch well; leave them at half a cable on the port hand. The South Chalk island just open northward of Hauseu island, N.W. ¾ N., clears the Alibi rock, the Isère rocks, and all the dangers on the east side of Kulangseu.

The wider channel on the west side of Kulangseu may be used without difficulty, but a vessel of large draught in entering should keep Druid head a little eastward of North to avoid a 3-fathoms spit, which extends off Anson bluff, on the eastern side of the channel. Cass spit, extending from the south-east point of Sung-seu island, has only 8 feet at low water on its extreme, which is one-third of a mile from the point; to clear it, do not shut in the white tower, which is on the low wooded point west of the Chalk islands, with the north-east point of Sung-seu, N. by W.

In working through this channel, standing westward towards Cass spit, keep the white tower open of the north-east point of Sung-seu; this mark,

* Richard W. E. Middleton, Navigating Sub-Lieutenant, R.N., H.M.S. *Cockchafer*.

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however, is difficult for a stranger to recognise from the sails of the numerous fishing boats. Standing eastward, Druid head and the small joss house may be approached to three-quarters of a cable. If obliged to tack between the small joss house and Modeste point, keep Druid head well in sight. Kiu-sung-seu is fringed with low-water rocks, and may be approached to about a cable. In making the eastern board towards the Isère rocks, tack when the small joss house is midway between First rock and Modeste point. When northward of the buoy on Kellett spit, or when the cathedral cross is in line with Dock islet, steer to the eastward for the anchorage off the city, keeping the South Chalk island open north of Hauseu to clear the Isère rocks.

On entering Amoy,* if foggy, after passing between Tsing-seu and Chih-seu and unable to see Kulangseu, care should be taken to ascertain the direction of the tide as it runs here very strong, and vessels are often so drifted out of their course as to be compelled to anchor. As a rule, the ebb tide for the first three hours will be found setting strongest through the narrow channel north of Kulangseu and obliquely across the outer harbour, about south-east; and the last of the tide, making stronger through the broad channel south of Kulangseu, will generally be found setting more easterly and directly through the fairway.

In working out with the ebb tide it is not advisable to stand in close to Tsing-seu or Chih-seu on account of the eddies and chow-chow water; the tides at springs run very swiftly between the islands and set obliquely, N.E. and S.W., across the outer harbour.†

Vessels of large draught should pass northward of Kellett spit buoy, as immediately inside it are only 18 feet at low water. Many vessels have passed over the Isère rocks with impunity, owing to the great rise of tide, but some in doing so have been greatly injured, and in the case of the *Isère* a total shipwreck was the consequence.

The formation of the bottom in Amoy harbour appears as irregular as the sudden and abrupt falls on Kulangseu. The residents are of opinion that the patches are mushroom shaped, and consequently when cables wind round them they are irrecoverable.

When there is much shipping in the inner harbour, the easiest way often to get out is to go round to the westward of Kulangseu.

The channel around Amoy island is so narrow and winding that directions would be useless; the chart is the best guide. The bay of Sungseu, on the north side of which the city of that name is built, runs

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* Richard W. E. Middleton, Navigating Sub-Lieutenant, R.N., H.M.S. *Cockchafer*.

† A sailing vessel beating out of Amoy on the ebb, should be careful not to be becalmed under Tsing-seu, as the tide runs strong towards it.—*J. W. King, Master, R.N., H.M.S. Vernon*, 1847.

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back 7 miles to the westward from Kulangseu; it is, however, shoal, and only navigable for small craft.

Supplies.—Supplies are fairly good; sheep difficult to procure, having to be imported from Hong Kong, coal for H.M. ships, is not now stored at Amoy. It can however be obtained. As the tides are strong, loaded lighters will only leave the depôt or coal vessel with a fair tide.*

* There is a local government contract, which is annually renewed, stipulating a constant supply by the Vendor of any quantity up to 300 tons. The present contractors are Messrs. Pye. Remarks by Captain R. H. Napier, H.M.S. *Magpie*, 1880.

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CHAPTER IV.

EAST COAST OF CHINA—AMOY TO THE WHITE DOG ISLANDS, AND PESCADORES.

INCLUDING CHIN-CHU HARBOUR, HUNG-WHA SOUND, HAITAN STRAIT, AND FORMOSA BANKS.

VARIATION 20′ to 1° West in 1884.

QUEMOY ISLAND is separated from Amoy by a channel 5 to 7 miles wide, in the middle of which is Little Quemoy island. Between Tae-tan island and Little Quemoy the channel is deep, but narrowed by reefs.

The channel between Little Quemoy and Quemoy is half a mile wide. To enter, bring the north-east point of Little Quemoy on a N. ½ E. bearing, and steer for it until the pagoda on Quemoy bears East, then haul to N.E. by N. for a mile and anchor in about 9 fathoms secure from all winds. Vessels drawing less than 15 feet may borrow over on the Little Quemoy shore.

Quemoy bank extends 3 miles southward from the west point of Quemoy, and several patches, on which the sea breaks heavily, dry on it at low water. It is steep-to, and the lead will give no warning. Its western edge bears S.S.W. ½ W. from the west point of Quemoy; and its southern end, *Quemoy spit*, S. by W. ½ W. from Quemoy pagoda, and W. by S. ¾ S. from Leeo-lu head; since 1874 it has extended to the S.S.E. (*see* page 204).

At its southern end Nantai pagoda is seen nearly in line with the north end of Wu-sen island bearing W. ⅞ S.

Buoy.—A *red* conical buoy, 6 feet in diameter, surmounted by a *black* spherical cage, has been placed on the southern edge of the shoal patch which has formed about 1 mile S.E. ½ S. from the end of the Quemoy spit. The buoy lies with the following bearings, Leeo-lu head N.E. by E. ⅔ E.; the west point of Quemoy N. ⅜ W. and the S.W. point of Little Quemoy N.W. ⅛ W.

LEEO-LU BAY.—From the west point of Quemoy the coasts trends S.E. ½ E., 3 miles to the south-west point, and is composed of low sand hills; thence it runs N.E. by E. 5 miles to Leeo-lu bay. Detached

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rocks extend 8 cables eastward of the south-west point, the highest of which is 15 feet above water, the outer rocks under water; great care must be taken to avoid them in foggy weather, as the tides here are uncertain in their direction.

This bay is said to afford good shelter from N.W., round northward, to East.

Leeo-lu head, 57 feet high, the south-east entrance point of Leeo-lu bay, is a peaked islet joined to Quemoy island by a reef. At 3¼ miles N. by W. from Leeo-lu head is Leeo-lu hill, 780 feet high. A spit of 3 fathoms projects a mile from the eastern shore of Leeo-lu bay; from the extremity of this spit Leeo-lu hill bears N. ¾ E.

Anchorage.—Leeo-lu bay affords shelter with winds from N.W., round by North, to East, and good anchorage may be obtained in 5¼ fathoms, mud and sand, and Leeo-lu head bearing E. ¼ S. and Leeo-lu hill N. by E. ¼ E.; small vessels may anchor in 3¾ fathoms, mud and sand, with Leeo-lu head S.E. by E. ¾ E., and Leeo-lu hill N. by E.

Tides.—It is high water, full and change, in Leeo-lu bay at noon; springs rise 17 feet.

HU-I-TAU BAY, formed between the eastern side of Quemoy and the mainland, affords good shelter in the N.E. monsoon.

Hu-i-tau point, the eastern entrance point of Hu-i-tau bay has an obelisk about 10 feet high. Being of a light colour it does not show well against the sky, nor against the land; with the naked eye it cannot be seen at a distance of 2 miles. It has the appearance of a chimney. On the hills north of the point is a small fort, and to the northward of the fort, a remarkable knob, 215 feet high.* On the north-west side of the bay are two remarkable hills, which serve to establish a vessel's position when in this vicinity. West peak, the highest of the two, is 1,714, and East peak, 1,390 feet above the sea.

Fort

Knob.

At 1¼ miles south-eastward of Hui-i-tau point is a sunken rock, on which 2¾ fathoms were found, but as in all probability there is less water its locality should be avoided. From the shoalest water obtained, the obelisk on Hu-i-tau point bore N.W. by W.; Dodd island S.W. ¼ W.; and Scrag point N.E. Reefs, which break heavily in bad weather, project

* *See* Admiralty plan of Hu-i-tau and Chimmo bays, No. 1,959, scale, $m = 1$ inch. The fort and knob are much alike, and may easily be mistaken.—Captain R. H. Napier, H.M.S. *Nassau*, 1877.

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3 cables in a southerly direction from the point, and westward a quarter of a mile from the first point inside the bay.

Water may be obtained under the fort northward of Hu-i-tau point.

CAUTION.—In the N.E. monsoon, if outside the limits of the regular tides, vessels must calculate on a southerly or south-westerly set, and frequently in the other season of the year, though not invariably at this part of the coast, on a set in the contrary direction. This circumstance may in some instances probably account for Hu-i-tau bay having been mistaken for the entrance of Amoy harbour. This has occurred on several occasions, and Dodd island has been also mistaken for Chapel island; it therefore becomes necessary to point out descriptively the dissimilarities of the two approaches.

Matthews islet,* 40 feet high, lies $1\frac{3}{4}$ miles E. by N. from Leeo-lu head and about a quarter of a mile from the shore; a reef which dries 3 feet on its outer part extends 3 cables S.S.W. from Matthews islet.

Dodd island, in lat. 24° 26′ N., long. 118° 29′ E., and about 83 feet high lies E. by N. $\frac{1}{2}$ N. $2\frac{3}{4}$ miles from Matthews islet; it may be distinguished from Chapel island by a reef extending a quarter of a mile N.E. of it. At $1\frac{1}{4}$ miles E. by N. is a $2\frac{1}{4}$-fathoms patch on which the sea breaks occasionally; and half a mile N.W. by W. a reef which dries 7 feet, having at 2 cables west of it a detached rock with 8 feet water. Its outline is uneven, and gradually sloping to the eastward. Chapel island rises suddenly, and there is a difficulty in saying which is the highest part of its smooth top; it is, moreover, 8 miles from the nearest land, whereas Dodd island is but 3 miles. The distance from Chapel island to the south point of Quemoy is 11 miles, but from Dodd island to Hu-i-tau point is only 5 miles. Off the south end of Quemoy the rocks are peaked; but the reef off Hu-i-tau point is flat. There are two pagodas on Quemoy point, which bear N.W. by W. and S.E. by E. of each other; on Hu-i-tau point is a small obelisk; and the land turns suddenly to the northward.

Dodd head, the east extreme of Quemoy island, is rocky, and rises to a peak nearly half a mile inland; numerous islets, reefs, and rocks front the shore in the vicinity of this head; the easternmost reef dries 8 feet at low water, and lies about half a mile from the shore.

DODD PASSAGE, between Dodd head and Dodd island, is nearly 2 miles wide with irregular soundings of $4\frac{1}{4}$ to 8 fathoms. Steamers proceeding through this passage from the south-westward should not bring Leeo-lu head to bear west of W. $\frac{1}{2}$ N. until the extreme of Dodd head bears N. $\frac{3}{4}$ E., when it should be steered for on that bearing until Matthews islet bears S.W., with this bearing on astern a N.E. course will lead through

* *See* Admiralty plan:—Hu-i-tau and Chimmo bays, No. 1959.

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Dodd passage in 6 to 8 fathoms water: this passage is unfit for sailing vessels except with a leading wind.

Tidal streams.—During the month of April the flood stream in Dodd passage was observed to run north-east and the ebb south-west; southward of Leeo-lu head the flood stream sets west, and the ebb east.

LIGHT.—On 18th October 1882, a light was exhibited from a light-house lately erected on Dodd island, southern side of entrance to Hu-i-tau bay:—

The light is an *occulting* light, showing alternately for *twenty-six seconds*, and suddenly eclipsed for *four seconds*, elevated 147 feet above the sea, and should be visible in clear weather from a distance of 18 miles. The light shows *white* seaward between the bearings of S. 51° W. and N. 62° E.; *red* between N. 62° E. and N. 74° E.; *white* inshore between N. 74° E. and S. 31° W.; and *red* from S. 31° W. to S. 51° W. The sectors of *red* light are intended to warn vessels when they approach the land. The lighthouse consists of a circular tower, constructed of brick with stone dressings, 50 feet high, with a total height from base to vane of 79 feet. The tower and dwellings are painted white.

Fog Signals.—During thick or foggy weather—should a bell, fog horn, steam whistle, or other sound be heard, indicating the proximity of a vessel—*two guns* will be fired with an interval of *half a minute* between them; and, if the vessel's fog signal is still heard, the firing will be repeated after an interval of *fifteen minutes*.

Oyster islet and rock.—Oyster islet is a low flat rock bearing N.N.W. $\frac{3}{4}$ W. 2 miles from Hu-i-tau point. Oyster rock, awash at low water, lies S. $\frac{1}{4}$ W. 9 cables from the islet, with the obelisk on Hu-i-tau point bearing S.E. by E. $\frac{3}{4}$ E., the fort E.N.E., and the summit of Flak island in line with the left slope of a conical hill at the head of the bay, W.N.W.

Thalia bank occupies a central position in Hu-i-tau bay, and its east end bears W. $\frac{1}{2}$ S. about 2 miles from Hu-i-tau point, and N. by E. $\frac{1}{2}$ E. from Dodd island; thence it extends to the north-westward beyond the White rocks. The eastern end has $1\frac{3}{4}$ fathoms on it; the western end dries. The north-east part of the bank is steep-to, *the lead giving no warning*.

TIDES.—It is high water, full and change, in Hu-i-tau bay, at 0h. 15m., spring rise 16 feet.

DIRECTIONS.—Vessels requiring shelter during the N.E. monsoon in this bay, will find good anchorage on its eastern side between Oyster islet and Oyster rock, taking care to avoid the latter which only shows at low water springs. There is also anchorage westward of Oyster islet in 5

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fathoms, but the islet should not be brought to the southward of East, as a rocky ledge of only 6 feet water lies 6 cables W.N.W. of the islet.

Vessels seeking shelter in a southerly wind, can run up the bay to the northward of White rocks and Thalia bank, and find anchorage in 5½ fathoms at half a mile north-east of Flak island. To avoid the northern edge of Thalia bank, do not bring Flak island to the northward of W. by N. ¾ N.; and by keeping Oyster islet open northward of the fort, the bank will be avoided which extends from the north side of the bay.

The channel between Thalia bank and Quemoy is foul with several reefs, and should not be attempted without some previous knowledge. To clear the south end of Thalia bank, keep the chimney on the north end of Quemoy on a W. by N. ¾ N. bearing until White rock bears North, then steer N.W. until the rock is N.E. by E., when shape a course to pass half a mile from the points of the bays on the Quemoy shore.

The channel north of Quemoy having 8 feet in it at low water, might be used at high tide; but no vessels should attempt it without a pilot.

CHIMMO BAY.—The coast from Hu-i-tau point trends 9 miles to the north-east to Chimmo point, and is low, the sand hills rising about 300 feet. Near the coast are two walled towns, the southernmost of which has a small pagoda near it. None of the bays afford shelter. H.M.S. *Reynard* tried that under Scrag point, but was compelled to use her screw to get out of it, and H.M.S. *Nassau* in 1877, experienced such a heavy swell that a second anchor was let go; the bottom is hard sand.

A reef which breaks, projects for a considerable distance to the north-eastward from the point bearing S.W. ½ W., 1 mile from Scrag point.

Chimmo bay is between Chimmo point on the south, and Yungning point on the north, and its locality will be easily recognised when approaching from the eastward, by Mount Kusan and its pagoda, which is 760 feet above the sea, and 1¾ miles from the beach on the north side of the bay. The mount is the most conspicuous land on this part of the coast, and a fine land-mark from the offing in hazy weather; to the north-eastward and separated from it by a deep gap or valley, is a double topped hill of nearly the same elevation. The shores of the bay, although barren, are populous; the inhabitants bear a bad character, and it was here that the crews of the opium vessels were attacked in 1847. The walled town of Yungning stands on the northern shore.

On the south side of the bay, off Chimmo point, are Sour and Pagoda islets, the channels between which, and between Pagoda and Chimmo point are full of rocks. N. ½ W. 6 and 7 cables respectively from Sour islet, are the two Chimmo rocks, which show at low water; when on them the east end of Pagoda islet is on with Flat reef, bearing S. ½ W.

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To pass northward of these rocks bring a large tree,* which stands half a mile from the beach in the north-west part of the bay, open westward of a remarkable shoulder peak 3½ miles at the back of it, bearing N.W., and when Yungning islet (off Yungning point) is on with Junk head (the first point to the north-east of it), the vessel will be northward of them; from these rocks to Yungning islet the distance is 1¼ miles.

This bay can only be termed a roadstead, and is dangerous in the southerly monsoon. Yungning islet is steep-to, but the reef lying W. ¾ S. 3 cables from it, covers at high water. Within the bay the depths shoal gradually, but vessels drawing 15 feet and upwards must not bring Yungning islet to the southward of E. ¾ S.

TIDES.—It is high water, full and change, in Chimmo bay at 10h. 20m.; springs rise 16 feet. The tide sets with considerable strength along the coast, between Hu-i-tau and Chimmo bays; but both the period and the rate vary considerably with the monsoon: the state of the tide will be known by the numerous fishing nets moored off the coast.

CHIN-CHU HARBOUR.—The coast from Chimmo bay trends N.E. by N. 8 miles to Chungchi point, the southern point of entrance to Chin-chu harbour. The several sandy bays between these points afford shelter to junks, but from the number of rocks in and about them they cannot be recommended for square-rigged vessels. At 1½ miles southward of Chungchi point is Bell islet with a building on it something like a bell. The islet is indistinct.†

Chungchi point, about 400 feet high, has sunken rocks extending 2 cables from it to the south-eastward. The entrance to the harbour is about ten miles wide between this point and the town of Tongbu to the north-east, but the shores rapidly approach each other, so that its proper entrance may be considered to be not more than 4⅓ miles wide between Chungchi point and the point north of it.

PILOTS.—Chin-chu harbour is the only place where pilots can be obtained for Hai-tan strait or Hungwha sound, and it is advisable that vessels bound there should take one, as the navigation is intricate.‡§

* This tree is not discernible seaward of Chimmo bay, Captain R. H. Napier, R.N., H.M.S. *Nassau*, 1877.

† *See* Admiralty Plan of Chin-chu harbour, No. 1,769; scale, $m = 1\frac{1}{2}$ inches.

‡ *See* Admiralty Chart of "the narrows of Haitan strait" No. 817; also "Hai-tan strait" No. 1985.

§ Edition of 1874.—The surveys of part of Hungwha sound, and the Narrows of Haitan strait made by H.M.S. *Nassau* in 1877, renders the services of a pilot less necessary than formerly; indeed, if the directions given at pages 222, 223, and 231 are closely attended to, no difficulties should be experienced. These channels cannot, however, be navigated with safety in thick weather.—Captain R. H. Napier, R.N.

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PASSAGE ISLAND is 4¼ miles N.E. ¾ N. from Chungchi point, is about 30 feet high, and has a dried scorched appearance; to the eastward of it are three rocks, which cover at high water: the outermost rock bears E. ¾ S., half a mile from the island. A ledge also extends from the south-west point of the island, the outer rock of which is 1½ cables from high water mark.

White rocks lie N.E. ½ N. about half a mile from Passage island and are always partly uncovered; the channel between them is not safe. At three-quarters of a mile northward of these rocks is Tahkut, an island (at high water) with a large town on it and a fort on its south end, and in the space between is a sunken rock, from which the highest part of the northern White rock bears S. by W. ½ W. half a mile, and the summit of Tatoi W. by S. ¾ S.

TATOI and SEATOI ISLANDS lie between these points, with the Hewen rocks above water, lying half a mile S.W. of Seatoi; these all lie in a N.N.E. and S.S.W. direction, and between them are the navigable channels to the Lockyung river entrance. Seatoi is a low barren islet; Tatoi, 358 feet high, is the highest land in this neighbourhood. Seatoi bank, with 2¼ fathoms on it, extends about 2 miles eastward of Seatoi island; and the Boot, an extensive sand, runs westward from Tatoi island to the entrance of the river.*

Lynx, Taheen and Hewen rocks.—Lynx rock, with only 6 feet water over it, lies E. by S. southerly, not quite half a mile from the highest part of Seatoi, with Tatoi summit N. by W. ¼ W., and Passage island N.E. by E. ½ E. Taheen rock is 2 cables S. by E. of the Lynx, and shows at low water; when upon it, Choho pagoda bears W. ¼ N. and Tatoi summit N. by W. ¼ W. The bottom between Taheen and and Hewen rocks, S.W. of Seatoi, is rocky and uneven, and in several places has only 6 feet at low water; a channel through, however, is sometimes used by the opium vessels when the wind is too far to the eastward to permit them to fetch between the Lynx and Seatoi. The highest part of the Hewen in line with Choho pagoda W. ⅓ N. will lead one cable south of Taheen and north of a 6 feet patch.

Mid-channel reef.—Between Seatoi island and the Hewen rocks, rather more than a cable from the south-west point of the former, and a good half cable from the latter, is Mid-channel reef, three points of which show at low water springs; it is about 2 cables in circumference, and from its centre the summit of Tatoi is in line with the west summit of

* The drying part of the Boot sand has extended 3 cables towards Choho point. Lieutenant A. Carpenter, H.M.S. *Magpie*, 1882.

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Seatoi. Reefs also extend half a cable from the south, south-west, and eastern sides of Seatoi, thus rendering the channel between this island and Mid-channel reef exceedingly awkward to a stranger.

Choho reef.—A sandspit extends nearly 1¼ miles in an easterly direction from Choho pagoda (230 feet), and from a reef lying on its northern edge, the pagoda bears S.W. ¾ W., distant 6 cables, and the summit of Pisai island W. by N. ½ N.

Ota rock, which covers at high water, is East half a mile from Pisai, and N.W. ½ N. from Choho pagoda.

TIDES.—It is high water, full and change, at Pisai island in Chin-chu harbour at 0h. 25m., springs rise 17 feet.

DIRECTIONS.—Kusan pagoda, 760 feet above the sea (page 212), is an excellent mark for recognising the locality of Chin-chu harbour when approaching it from the southward. From a position about 1¾ miles eastward of Chungchi point, steer North until Choho pagoda opens northward of Seatoi island bearing W. ¾ S., when the pagoda should be steered for on that bearing, and it will lead along the northern edge of Seatoi bank. The ship *Omega*, drawing 11 feet, struck on a bank 1½ miles eastward of Seatoi, but not less than 2¼ fathoms were found upon the Seatoi bank in March 1844; the southerly monsoon may, however, cause the sand to accumulate at times.

With reference to the foregoing, Lieutenant A. Carpenter, R.N., H.M.S. *Magpie* (1882), makes the following observations:—"The soundings between Seatoi island and Lynx rock, and from thence, out eastward, passing northward of Seatoi bank, have all shoaled 1 fathom."

"Owing to this and the heavy swell which rolls in (if blowing outside), the passage is a dangerous one to vessels of over 10 feet draught at low water. Seatoi bank has slightly shoaled, and there are frequently overfalls on it. There is no passage between Seatoi island and Boot sand. At high water Seatoi island shows 3 summits, the south-western being an isolated black rock. The east summit is 35 feet high; vessels should keep well to the northward of the clearing mark on the plan,* and pass 1½ cables from the east end of Seatoi island, but only half a cable from the S.W. corner."

If running for the harbour from the northward, and intending to anchor southward of the Boot sand, after passing about three-quarters of a mile south of Passage island steer in with Choho pagoda W. ¾ S., until the peak on Tatoi island bears N. by W. ½ W., and the eastern end of Seatoi island S.S.W. ½ W., then haul to the southward, and pass a cable eastward of the east point of Seatoi. Round the south side of Seatoi at half a cable,

* Admiralty plan of Chinchu harbour, No. 1,769.

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and when its western summit is on with the highest part of Tatoi the vessel will be in the narrowest part of the channel, which is here barely a cable across.

Having passed Seatoi a W.N.W. course will lead to the anchorage above Pisai island in mid-channel. By keeping this island westward of W. by N. ½ N. the reef off Choho pagoda will be avoided; and the southern edge of the Boot will be cleared by not bringing Seatoi to the southward of E. by S. ¼ S.; the outline of this bank, however, is generally visible (*see* foot note page 214). The opium vessels run in between the Lynx and Taheen rocks with the south extremes of Seatoi island and Ota rock in line with north extreme of Pisai. The anchorage is North about 1½ or 2 miles from Pisai, where the channel is 3 cables wide.

If wishing to anchor on the north side of the Boot, steer to pass northward of Tatoi island, and if drawing less than 15 feet a vessel may run up until Choho pagoda bears S. by W. ½ W., where she will have smooth water in any weather, as the Boot forms an excellent breakwater. The north edge of the Boot will be avoided by keeping the White rocks southward of East. A sunken rock lies 1½ cables from the northern shore, and N. by W. ½ W. from the summit of Tatoi. There is good anchorage in north-east or northerly gales in 3½ and 4 fathoms, with the summit of Tatoi S.E. by S; but in a south-west gale the former anchorage is to be preferred. The Boot may be crossed by a vessel of light draught at high tide, but it should be sounded first, as the sands are liable to shift.

The entrance of the small river, leading to the town of Chin-chu is 3 miles W. by N. ¾ N. from Pisai island. On the left bank near the entrance is a circular fort, 4 or 5 miles above which is the town standing on the north bank of the river. The channels to it are shoal and intricate and the large junks have to wait in the neighbourhood of Pisai for tide before they can cross the flats, which are covered with artificial oyster beds.

TONG-BU BAY.—About 10 miles N.E. by E. of Chung-chi point is the town of Tong-bu, south-westward of which is a large open bay or roadstead, affording anchorage in 7 to 4 fathoms, with good shelter in the N.E. monsoon; it cannot, however, be recommended, on account of the exceedingly rocky character of the coast.*

Juno rock.—This sunken danger, on which H.M.S. *Juno* struck when standing for an anchorage in Tong-bu bay, is a cluster of rocky

* Fair anchorage may be found in the N.E. monsoon in the little sand bay immediately west of Tong-bu fort (*see* plan No. 1769), with the west angle of the fort bearing N.E. by E. ½ E., and the S.W. entrance of the islet off the fort S.E. by E. ¼ E. in 28 feet (mud) 2 cables from the islet.

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heads covered with coral, with 12 feet at low water, and 5½ to 5 fathoms around. From the rock, the west corner of Tong-bu wall bears N.E. 1¾ miles, the summit of an islet in the bay N.W. ½ N., Tahkut island fort W. ½ N., and Passage island W. by S. ½ S.

PYRAMID POINT, at 3 miles eastward of Tongbu, is the southern point of entrance to port Matheson, and when approaching on a westerly bearing, it appears a bold black face of land, not in any way representing its name; but on a northerly bearing, or inside the point, it cannot be mistaken.

Pyramid rock is about 60 feet high, and surmounted by a conical building 20 feet high, it is connected with the point at low water, and to the S.E. of it is a rock which never covers. To the eastward of the Pyramid are several reefs, from the outermost of which the Pyramid bears S.W. by W. ¾ W. 6 cables, the highest part of the land forming the north side of port Matheson N. by E., and a cliff head at the head of the promontory (extending south-westerly from the above hills) is in line with a remarkable cone in the bay N. by W. ½ W.

Anchorage.—Small vessels will find anchorage in the N.E. monsoon in the first bay westward of Pyramid point, where they will be sheltered to the eastward by the reef of rocks, mostly above water, extending south-east from the point, and forming a good breakwater: care must, however, be taken to avoid a sunken rock lying South, a cable from the first point eastward of the walled city of Tongbu. As, however, they have to go close in, a better anchorage is said to be westward of the rocks of Tongbu. Fish is plentiful.

PORT MATHESON, called by the Chinese Gulai, is the next inlet to the north-east of Chin-chu, the isthmus near the city of Tongbu being only a mile across. The port is 4 miles wide at entrance and affords good shelter to vessels of light draught if the wind be northward o E.N.E., but it is little better than a roadstead, and exposed to all winds between S. by E. and E.N.E. H.M.S. *Nassau* anchored here in 1877 in 29 feet (soft mud, at low water neaps) on the following bearings:—N.E. extreme of Bay, N. 71° E.; rock off western islet of northern group in, bay N. 49° E.; West extreme of south islet S. 22° W.; and a remarkable brown, cone-shaped hill N. 5° W. This hill is the highest of 3, and forms a good coast mark. The western islet of the northern group is about 70 feet high, South islet about 120 feet.* There are no dangers in it except a rock lying North 4 cables from the largest islet on the southern shore.

* If bound north; at a distance of about 10 miles from land, when abeam of Pyramid point, Cone hill will be seen, showing out conspicuously, being the *only* conical-shaped mountain in the vicinity; as the cone disappears behind Gulai point, Sorrel rock will be the northern land visible; and when that is obscured, or shortly after, Ockseu island will be discerned in clear weather. It was seen 18 miles distant on a N.E. by E. ½ E. bearing by H.M.S. *Nassau* in 1877.

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CONE HILL.
PORT MATHESON.

MEICHEN SOUND, the next inlet north of port Matheson, is 6 miles across at the entrance, which may be recognised by the Ninepin rock lying nearly in the middle of it. A reef extends South from the Ninepin, and at the distance of a mile in that direction is Square rock, one of a cluster of rocks, which does not cover at high tide; thence the reef extends south-westward 1½ cables, and its outer part dries at low water.

East, 6 cables from the Ninepin, is a flat patch of rocks awash at high water, and between this patch and Rogues point is good anchorage in the N.E. monsoon. H.M. brig *Plover* rode out a gale westward of the Ninepin, without much strain upon the cable, but with an uneasy sea; anchorage was therefore preferred under Rogues point; but since that period H.M.S. *Scout* found a rock here which renders this anchorage more difficult of approach.

Scout Rock lies midway between the Ninepin and the extreme of Rogues point, bearing from the former E. by S. ¾ S., and South from the mound at the end of the sandy isthmus connected with Rogues point.

H.M.S. *Comus*, August 1856, anchored in 8½ fathoms with the Ninepin bearing South, Rogues point S.E. ¾ E., and a small white rock off Meichen village E. ¼ N.; but it was considered an unsafe anchorage during the southerly monsoon and many rocks were seen in the sound, which are not noticed in the chart.

N. by E. ¾ E., one mile from the Ninepin, is a rock which shows at low water, and from it the highest part of Rogues point bears S.E. by E. ½ E. There is a passage between this rock and the Ninepin, but rocks extend a cable from the latter. Rogues point may be approached without fear except on its east side, where there is a reef rather less than a cable from the shore; 3½ and 4 fathoms will be found at the distance of 3 cables from the sandy spit west of it. South 1½ miles of Rogues point is a patch of 4¾ fathoms water.

Inner Harbour.—In the southerly monsoon vessels will find a good harbour to the north-west of Saddle island, which bears N.W. by N. 3¼ miles from the Ninepin. In approaching it, pass southward of the south islet off Saddle island, and haul to the northward round the western islet, giving it a berth of a cable at high water to avoid a ledge. The ground is very uneven hereabouts, and there are only 2½ fathoms water at a mile W.N.W. of the western islet.*

* *See* Admiralty chart, East Coast of China, Sheet 5, No. 1761; scale, $n = 0{\cdot}24$ of an inch.

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N. by E., one mile from Saddle island, is a low Cliff islet, from the west point of which a sand bank extends 1¾ miles to the north-west; the south peak of Saddle island kept eastward of S.E. by S. will lead westward of it. When Mound peak (which is on the mainland, and 3 miles northward of Saddle island, with a walled town and pagoda near it) bears East, a vessel will be northward of this bank and can haul in towards the town. W. by N. ½ N., 2½ miles from Mound peak, is a knoll with only 6 feet over it.

The junks use the channel between Mound peak and Cliff islet, and also pass between Mound peak and Meichen island. The former channel is deep, but requires personal knowledge; the latter is strewn with rocks, and in some places has not a greater depth than 9 feet. The sound runs back 10 miles to the northward of Mound peak, forming narrow isthmuses across to Pinghai bay and Hungwha sound.

TIDES.—It is high water, full and change, in Meichen sound at 0h. 30m., springs rise 17 feet.

SORREL ROCK, bearing E. by N. 3¾ miles from Rogues point, is 60 feet high, and has a detached rock three-quarters of a cable south of it.

PINGHAI BAY, the next inlet north-east of Meichen sound, is 6½ miles wide at entrance, between the Rowan islands on the west and Ping point on the east, and shoals gradually from 5 to 3 fathoms. Ping rock, 90 feet high and conical shaped, lies 4 cables southward of the latter point, and 9 miles N.E. by N. from the Sorrel rock; there is a sunken rock S.W. by W. a quarter of a mile from it.

The anchorage in this bay is in 3 fathoms off the town of Pinghai, with the Ping rock bearing S.E. by E. At 5 miles north-westward of the anchorage is a high range of hills, one of the peaks of which, Marlin Spike, is a good guide for this part of the coast. The bay runs back past the foot of the Marlin Spike range, but is shoal, there being seldom more than 2 fathoms westward of the range.

Reefs extend nearly a mile from the coast to the northward of Ping rock.

LOUTZ ISLAND,* 70 feet high, is about 5¼ miles E.S.E. from Ping rock, and between them, 1¾ miles from Loutz, are two sunken rocks, named Loutz shoal, from which the Ping is in line with Marlin Spike peak N.W. by W. ¼ W.; and the islet lying N.E. ¾ E. of the Loutz in one

* Formerly called Loutz rock; but this was "a misnomer, since it is larger than most of the Yit group." "From the south-west approach to the Lam Yit channel, it makes long, low, and flat."—*Navigating Lieut. J. W. Dixon, Nassau,* 1877.

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with the South Yit, E. ¾ N. N.N.W. 2 cables from the above islet (which is 20 feet high, and peaked), is a half tide rock, and another S. ¾ W. 8 cables from the islet and East from the highest part of the Loutz: about a quarter of a mile east of the latter 7 fathoms was obtained by H.M.S. *Nassau* in 1877.

OCKSEU ISLANDS.—The Ockseu or Wokeu group consists of two islands, with a barren rock in the centre joining the eastern island. The north-western island, the largest, is about 237 feet above the sea, round topped, with smooth sides, and bears from the Sorrel rock E. by S. ¼ S. 15½ miles, and from the South Yit S. by W. ½ W. 10½ miles.* The eastern island is about 150 feet high, rather hummocky and sandy, with a large fishing village on it, and detached rocks off its east and west points.

LIGHT.—From the summit of the north-western island is exhibited a *revolving* light showing a white flash *every minute*, elevated 286 feet above the level of the sea, and which in clear weather should be seen from a distance of 24 miles.

The illuminating apparatus is dioptric or by lenses, of the first order.

The tower, 64 feet high, is round, built of stone, and painted black; the keeper's dwelling and wall are painted white. Position, lat. 24° 59′ N., long. 119° 28′ E.

Fog Signals.—In thick or foggy weather, when a vessel is known to be in the vicinity, three guns will be fired at *two* minutes interval between them; to be repeated if necessary after a further interval of *twelve* minutes.

Anchorage.—During the north-east monsoon there is well-sheltered anchorage to the southward of the western and larger island, about a mile off shore, in 13 fathoms, with the west extreme of the western island bearing N. by E. ¾ E., and the east extreme of the eastern island E. ½ N.

The eastern island has many huts and houses, the western one comparatively few.

LAM-YIT ISLAND, the southern and largest of the archipelago called the Eighteen Yits, is 7 miles long E.S.E. and W.N.W., and fronts the deep and extensive inlet, Hungwha sound. The eastern peak, High cone, 565 feet above the sea, and the highest point of the island, is in lat. 25° 12′ N., long. 119° 35′ E.

The south point of Lam-yit is a bold table land, and off it, and connected at low water, is South Yit islet, to the north-west of which will be found

* A strong tide ripple, or reef, appeared to break about 1½ miles W.N.W. of the western Ockseu island.—Commander J. C. D. Hay, *H.M.S. Columbine*, 1848.

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a snug and excellent anchorage, in 7 to 10 fathoms, in the N.E. monsoon. East ½ a mile from South Yit, with Triangle Yit bearing N.E. by E. ½ E., is a rock which was first seen by H.M.S. *Moorhen* (1877). On rounding give the islet (which appears like a mass of black stones heaped up against the side of a sandhill), a berth of half a mile and then haul up into the bay, being prepared to anchor directly the water shoals. N.W., 2 miles from the South Yit, is a flat rock which is always above water; and S. by E. 4 cables from this rock, is a reef awash at low tide. This and Duke reef are the only dangers in the bay on the south shore of Lam-yit island; they will be avoided by keeping within 1½ miles of the South Yit, should the vessel not fetch up into smooth water after rounding it.

Duke reef, which covers at high water spring tides, but breaks with any sea—at low water, is circular in shape, 150 yards long by 100 yards broad. It lies about 1¼ miles from the shore in South bay, with the following mark and bearings:—The small rock north-eastward of Loutz island in line with north extreme of Loutz island, W. by S. ¾ S.; Low cone, Lam-yit island, N. ¾ W.; South extreme of South Yit, S.E. by E. ¼ E.

South-eastward of Duke reef, at the distance of half a cable, there is a depth of 4 fathoms, increasing gradually to 10½ fathoms when one mile distant in that direction.*

LAM-YIT CHANNEL is on the west side of Lam-yit island, and a vessel proceeding through it towards Hungwha sound from the anchorage on the south side of Lam-yit, must be careful on the flood to steer well to the south-west to avoid a sand-bank extending 2¼ miles in a southerly direction from the west point of Lam-yit. From its southernmost edge, in 2¾ fathoms, the South Yit bore E. ¾ S.; its western edge will be avoided by keeping Lam point to the eastward of North.

H.M. brig *Plover* examined this bank three different times, and on each occasion found a change. On one occasion a passage was discovered between it and the point; the outline of the bank, however, may be detected by discoloured water. On the western side of the channel there is also a rocky patch of 1¾ fathoms, the eastern edge of which bears S. by W. 2 miles from Clam islet (the largest islet between Lam-yit and the main); from its southern edge, Lam point bore E. by N.

ANCHORAGE.—The *Plover* rode out a strong N.E. gale between Lam point and Clam islet; but better shelter will be found southward of Lam point, where the junks anchor. The outer rock off the point always shows, and may be rounded close-to; but it must not be brought westward of N.N.W., as the water shoals suddenly, and there is a sunken rock in the bay at 6 cables southward of it. The best position is as close up

* Captain R. E. Tracey, H.M.S. *Iron Duke*, 1881.

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under the point as the vessel's draught will permit. For vessels of large draught there is anchorage in 4 or 5 fathoms, at 1½ miles northward of the point.

HUNGWHA SOUND.—Besides Lam-yit island there are many islands and rocks within Hungwha sound, bordering its shores, the principal ones being near the entrance points. The only passages that must be used to enter it are the Lam-yit and Hungwha channels and Hai-tan Strait.

Pilots can be obtained at Chin-chu, *see* page 213.

Directions.—Before proceeding to the eastward, directions will be given for Hunghwa Bay Sound, which will render the remarks on the passage to the northward more compact. Bound through the Lam-yit channel for the entrance of Hungwha river, which flows into the western part of Hungwha sound, steer northerly 7 miles from Lam point, when the vessel will be one mile northward of Knob island, and may then proceed for Pitew point, which bears N.W. 7 miles from Knob. A patch of rocks lies north-west of Knob island, the eastern one of which bears N. by W. 8 cables from the island, and the north-westernmost N.W. ½ W. 1¾ miles; some of them are always above water. There is another patch off Pitew point, the south-east end bearing E.S.E. 2 miles from the south-east corner of the fort on the point. Good anchorage in 6 fathoms will be found with this corner of the fort E.N.E. The entrance to Hungwha river, leading to the town, bears W. by S. from Pitew point; the depth shoals to 6 feet at low water at 5 miles from the fort. In 1844 there was a piratical establishment on the main, S.W. from Pitew point.*

PASSAGE NORTH of LAM-YIT.—If intending to pass northward of Lam Yit island, the best channel is between Passage and Wilshere islands.

Cliff island, 97 feet high, situated about one mile north of Lam Yit island, is precipitous; patches of reef covered, at three-quarters flood, with deep water between, extend 1¼ miles E.N.E., and a reef, covered at half flood, lies S.E. by E., 3 cables from Cliff island. A quarter of a mile westward of this island lies a bank about one mile long north-west and south-east, and half a mile broad, with general depths of 3½ to 4½ fathoms; near its south-west edge there is a depth of 15 feet, at 1½ cables to the eastward of which there is a depth of 16 feet.

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* In 1877 great difficulty was also experienced by the officers of H.M.S. *Nassau* when landing on the coast eastward of Rugged island (Hungwha sound) to measure a base for the survey then in progress, owing to the hostility of the fishing population, and a serious fracas might have resulted but for the coolness and decision shown.

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In the channel between this bank and Cliff island, there are 7 to 15 fathoms water.

Passage islands, are three in number; Gough island, 95 feet high, the north-eastern island, is conical, bold, cliffy, and steep-to on its north side. A reef, drying 13 feet, lies 2 cables west of West Passage island; on the 5 fathom bank stretching to the south-eastward, is a rock, one foot above water, and a 6 feet patch which bears S.E. ½ E., 9½ cables from Gough island.

Three sunken rocks have been discovered lying in and near the northern channel between Passage and Red Yit islands.

1. DOUGLAS ROCK, on which the steam vessel *Douglas* struck in 1880, a pinnacle rock of very small extent (only a few feet), with 4 feet over it at low water spring tides, lying with the following bearings and distances, viz.:—

   Rock (one foot high) - - N. 22° E., distant $3\frac{6}{10}$ cables.
   Western summit of West Passage Island. - N. 48 W., „ $10\frac{2}{10}$ „
   Cliff island summit - - - S. 50 W.

   The *wreck* of the steam vessel *Douglas* bore in 1880, N. 67° E., distant 1½ cables from the Rock (one foot high).

2. The Northern of two pinnacle rocks situated south-eastward of Douglas rock; of very small extent, with 12 feet over it at low water spring tides, situated with the following bearing and distance, viz.:—

   Rock (one foot high) - - N. 10° E., distant $3\frac{9}{10}$ cables.

3. The southern rock, also of very small extent, with 6 feet over it at low water spring tides, lying with the Northern pinnacle bearing N. 14° E., distant $1\frac{3}{10}$ cables.

In the passage between Wilshere and Rugged islands, at 4 cables N.E. from Rugged island, lies a rock which dries 12 feet.

Anchorage.—At 2 cables south-west from Wilshere island, anchorage may be obtained in 12 fathoms mud, out of the strength of the tide.

White island, 130 feet high, situated near the centre of Hungwha channel, about 5 miles east of Passage islands, is round and bare.

South Kerr island, 54 feet high, lying 2¼ miles E. by N. from White island is round and bare.

Directions.—Vessels proceeding to the eastward through the channel south of Cliff island and North Yit rocks (formerly used by native pilots),

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should pass the islet, 40 feet high, which lies N.E. by N. from Lam point on its northern side about a cable distant, in 8 fathoms water, and the islet, 25 feet high, N.E. three-quarters of a mile from the 40 feet islet on its southern side, at the distance of a quarter to half a cable, in 4 fathoms; the 40 feet islet is steep-to on the northern side, but a reef extends a cable from the southern side; the 25 feet islet appears to be steep-to on the southern side.

As the north point of Lam Yit island is approached the water in the channel shoals to 3 fathoms; this point should be passed at a distance of 3 cables, and the north-west extreme of Red Yit island steered for, giving a fair berth to the northernmost of the islets which lie between Lam Yit and Red Yit. As the north point of Red Yit is approached, keep the 40 feet islet just open of the north point of Lam Yit, this will lead between North Yit rocks and the shoal water off Red Yit.

Owing to the discovery of Douglas rock, the channel between Passage and Cliff islands cannot be recommended, and should not be used except in cases of emergency.*

The channel north of Passage islands, is 4½ cables wide, with 14 to 20 fathoms water; after passing the 40 feet and 25 feet islets (lying N.E. of Lam Point) at about 2 cables distance, steer with Griffith island summit in line with west point of Rugged island, until Gough island bears East, when a vessel may steer to the eastward, passing between the islet, 3 feet high, south of Wilshere island, and Gough island. From abreast Gough island steer to pass a cable north of White island.

North Yit rocks are a cluster of rocks 3½ cables in extent, lying E. by N. ½ N. 2 miles from Cliff island, the westernmost rock dries 13 feet and the two easternmost 2 and 4 feet at low water; from the westernmost rock, the north point of Red Yit island bears S.E. three-quarters of a mile.

Red Yit rocks.—The northern rock lies with Red Yit summit (324 feet), bearing W. by S. distant 5½ cables.

The southern rock is situated S.E. by S. from the northern rock, distant 2 cables. These rocks dry 4 feet at low water springs.

Position: Lat. 25° 16′ 45″ N.; long. 119° 31′ 30″ E.

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* If intending to use this channel, after passing West of Cliff island (at about 1 cable distant), steer North, until the N.W. extreme of Gough island touches the S.E. extreme of West passage island; keep this mark on *ahead*—N.E. ¾ N.—until the western extremes of Wiltshire and West passage islands are in line; when turning sharply to *starboard*, alter to East (northerly), which course will lead direct through the passage When the S.W. extreme of East passage island comes in line with the west extreme of Rugged island, the vessel will be clear of all dangers on the *south* side of the channel.

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Hung rocks, situated E. ½ N. 2½ miles from North Yit rocks, occupy a space half a mile in extent E. by S. and W. by N., the westernmost rock dries 4 feet at low water; and the easternmost 8 feet from which White island bears N. ¼ E. 1¼ miles.

Chim island summit in line with South Kerr island bearing E. by N. ¾ N. leads north, and Cliff island open north of Red Yit island W. ¾ S. leads south of Hung rocks.

The EIGHTEEN YITS are a scattered group of small islands lying north-east and eastward of Lam Yit island, and extending over a space of 10 miles. On no account ought vessels to stand in among the Yits, as the ground is very uneven. Triangle Yit, with a reef off its east side, is 1¼ miles S.E. of High Cone peak on Lam Yit island. Cap Yit, the south-easternmost of the group, lies 4 miles E.N.E. from High Cone peak; and a group of low rocks named Scattered Yits, some of which are always above water, lie about 2 miles S.E. from Cape Yit. Double Yit, situated 1½ miles N.E. from Cap Yit, bounds the south side of Hungwha channel, which between Double Yit and Sentry island to the north-east, is 3 miles wide. Long Yit, 1½ miles west of Double Yit, and N.E. Yit, 1½ miles N.W. of Long Yit, are steep-to, and on the border of the Hungwha channel; North Yit rock, which bounds the group on the north, lies south-east of Passage islands at the eastern entrance to Hungwha sound.

Sunken rock N.E. of Long Yit.—A small rock with 2 fathoms water lies N.E. half a mile from the east extreme of Long Yit; steep-to on its eastern edge, but to the westward having the soundings irregular. When on the rock High cone in Lam Yit is in line with the eastern extreme of Long Yit.

The high cone of Lam Yit kept well open of the east extreme of Long Yit until the highest of Scattered Yits is in line with the western side of Double Yit leads to the eastward of the rock.

Dangers off Vangan point.—E. by N. ½ N., 4½ miles from White island, is Vangan point, the western entrance point to Hai-tan strait. Midway between White island and Vangan point lie the Kerr islands, from which a reef stretches to the southward, having on its outer limit a detached rock (dries 8 feet) bearing S.W. by S., 4½ cables from South Kerr island.

South 4 cables from Vangan point is Douglas islet, 47 feet high, with a deep and clear channel between; 9 cables to the north-east of Douglas islet is No pass rock, 15 feet high, inaptly named since there is a deep channel between it and the mainland, which is generally used by steam vessels during strong north-east winds.

A 3-fathom patch of small extent and steep-to, lies S.E., 7 cables from South Kerr island summit.

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Chim island summit in line with centre of Douglas islet bearing E.N.E., will lead clear of all dangers between Kerr island, and Douglas islet, which can be passed on either side at a distance of a quarter of a mile.

Volga rock,* with 4 feet water, situated S. by W. ½ W., 7 cables from Douglas islet, is of coral formation, steep-to on its west and south sides, with a 3-fathom bank extending from it in an E.N.E. direction nearly two cables. From this rock the northern portion of White island is in line with the north extreme of East Passage island, and the south extreme of Kerr island reef is in line with the south point of Rugged island.

Anchorage.—Although in the space to the eastward of Kerr island the soundings are irregular, good anchorage will be found during the north-east monsoon, in 6 fathoms, mud, with Punchard islet bearing N.W. by N., 4 cables distant, and in line with the Fort.

HUNGWHA CHANNEL,† which leads north of the Eighteen Yits, is bounded on the northern side by the islands and reefs off Vangan point, and by Sand, Sentry, and Reef islands. The channel which branches to the northward between Vangan point and Sand island, is the south entrance of Hai-tan strait.

Sentry Island, when bearing West, appears as two small islands. N.N.E. 4 miles from Double Yit is Sand island, a remarkable white island, with sandy beaches and detached hills.

Sedan rock is of small extent, with 8 feet water, and 11 to 13 fathoms close around.

From the shoalest part of this rock, Red Yit island summit is just seen open northward of the north extreme of Double Yit island, bearing W. ½ N., and Chim island summit is in line with the eastern extreme of the reef lying 3 cables westward of Bent island, bearing N. by W. ½ W.

Directions.—Entering Hungwha channel from the eastward, pass (taking care to avoid Comet and Sedan rocks, the former lying about 2 miles S.E. by E. from Sentry island) between Double Yit and Sentry island, southward of Sand island, and the rocky islets off Vangan point.

On no account should a vessel pass between Sand, Sentry, Reef, and Chim islands, as this locality has not been sufficiently examined, and care is necessary to avoid the reefs and rocks eastward and southward of Reef island. Two of these have been accurately placed, namely, Comet rock, with

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* On which the mail steam vessel *Volga* struck, 1873.

† *See* Admiralty plan:—Hai-tan strait, No. 1985.

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9 feet water, which lies 1¾ miles S. by W. ¾ W. from the summit of Reef island; and Breaker rock, which uncovers at three-quarters ebb, with foul ground inside it, lies 1¼ miles South of Reef island. The Sedan rock is the outer known danger. These rocks when covered are conspicuously marked by the tidal streams stirring up the muddy bottom. Reef island may be skirted at 1½ miles distance in 11 fathoms. Chim rocks (sometimes named Chim bank) may be passed on the east side at 3 cables in 14 fathoms.

HAI-TAN ISLAND.—This large and irregular shaped island, lying between the parallels of 25° 24′ and 25° 40′ N., is separated from the mainland by Hai-tan strait. Its northern part is high; the peak of Kiangshan hills rising 1,420 feet above the level of the sea, whilst the eastern and western shores are low, and indented by deep sandy bays. Numerous small islands and rocks occupy Hai-tan strait, and although it cannot be recommended to sailing vessels, except with a commanding wind, coasting steam vessels drawing 22 feet, and junks invariably use it; one of the latter was found lying there, having been detained 27 days waiting for an opportunity to get out at the northern end.*

Hai-tan point, the south extreme of Hai-tan island, is a rugged, sandy headland, with several rocks, 12 feet high near its south-west side; and a sunken rock nearly three-quarters of a mile S.W. ½ W. from the south-east extreme of the point. To avoid these dangers, Hai-tan point should not be closed within 1¼ miles, until Station island and Junk Sail rock are in line, bearing N.W., when the south-east entrance of Hai-tan strait may be steered for. Between the point and Station island, 3½ miles to the north-west, the coast of Hai-tan is shoal, with detached reefs, and should not be approached within 1¼ miles.

From Hai-tan point, the south-east coast of the island trends N.E. by E. ½ E., 3 miles to Trite island, having between a deep sandy bay, with several detached rocks.

There is a well-sheltered anchorage during the N.E. monsoon, N.W. of Trite island.†

Trite island, 90 feet high, with three peaks, has detached islets and reefs extending to the northward and westward, the south side of this island may be passed in 11 fathoms at 3 cables distant.

South reef, on which the sea breaks heavily, situated 2 miles S. ¾ E., from Trite island, covers at half tide; from the centre of the reef Chim island bears W. by. S. and Turnabout island N.E. by E. ¾ E.

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* *See* Admiralty plan of Hai-tan strait, No. 1985, scale m = 1 inch.

† Snb-Lieut. Andrew L. Murray, H.M.S. *Lapwing*.

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Hai head lies N.E. 2¾ miles from Trite island; eastward of it are several islets 60 feet high, joined by a reef uncovering at a quarter ebb. The southern shore of Hai head may be rounded at 1½ cables distant. A 5-fathom coral patch of small extent lies S.E. 2¾ cables from the south-east point of Chinseu island, east side of Hai head.

Dwarf anchorage,* on the west side of Hai head is free from rocks, with the exception of a reef drying 10 feet, N.W. by W. ½ W., 2 cables from Dwarf point. This anchorage is much used by the French mail steam vessels, when unable to proceed against the north-east monsoon; the anchorage for a large vessel is in 5¼ fathoms, sand, with Turnabout light-house seen just open of Dwarf point, bearing E. by S. ½ S. and Camfield point N. ¾ E., ; a smaller vessel can anchor in 3½ fathoms, sand, with Dwarf point S.E. by E. ¾ E. and Camfield point E. ½ N. The soundings decrease gradually to the shore.

Hai-tan and Kwing bays.—Between Hai head, and Tan point 7 miles N. by E. of it, is Hai-tan bay, a deep sandy bight, with numerous islands and rocks; several of the latter are covered at high water.

Bown rock, in the northern part of the entrance to Hai-tan bay, and S.S.W. ½ W. 2¾ miles from Tan rocks, is a pinnacle, drying 6 feet with 11 and 12 fathoms close to.

Tan point, the south extreme of Kwing bay, is a low cliff with a mound at the back; at 1¼ miles eastward of it are the Tan rocks, drying 15 feet. Kwing island, a mile north of Tan point, has reefs extending in a south-easterly direction a mile from its eastern side. The channel between is obstructed by reefs at its western end, and the swell rolls home to the Hai-tan shore. Between Kwing and Hai-tan islands is another islet; the tide however runs through the channels with such velocity that they ought never to be used. Kwing bay affords a fair anchorage during south-easterly winds, but is exposed during north-easterly winds.

HAITAN STRAIT.†—Chim island, situated at the junction of South, and South-east entrances to Hai-tan strait, is the highest island in this locality, and rises with sloping sides into two peaks, the higher being 769 feet above the sea, having on it three chimneys, the usual pirate signal along the coast of the Fu-Kyeu province. At 2¼ miles S.E. of Chim and 2 miles northward of Reef island are some rocks, with reefs interspersed, named Chim rocks.

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* *See* Admiralty plan of Dwarf Anchorage, scale *m* = 4 inches, on sheet No. 818.

† *See* Admiralty plans :—Hai-tan strait, No. 1985; and the Narrows of Hai-tan strait, No. 817.

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Station Island,* 59 feet high, is often difficult to make out until close to, but it may be recognised by a remarkable triangular white sand patch on Hai-tan island bearing North three-quarters of a mile from Station island.†

Edmond Reef, drying 15 feet, lies N.W. by W. ½ W., 4½ cables from Station island, another reef drying 20 feet, lies S. ½ E., 3 cables from the same island. The channel in this part, between the 5 fathom lines, is narrowed to 9 cables by the banks extending from Young and Station islands.

The Peninsular and Oriental Company's steam vessel *Sunda* was beached between Station island and Edmond reef, for repairs after striking on the Sunda rock; a more sheltered position would have been north of Edmond reef.

Mount Burnie, 1,326 feet high, situated west 4½ miles from Station island, is the highest land in the southern part of the strait, and forms a conspicuous mark from seaward.

Junk Sail rock, 39 feet high, has foul ground, extending a cable to the westward. The extreme of a mud and sand pit, steep-to, projecting from the island shore of the strait, lies S. by E. ¼ E., 3 cables from Junk Sail rock.

Pass island, 128 feet high, lies N.W. by W., one mile from Junk Sail rock; north-west of Pass island and joined to it by a narrow ridge of boulders and gravel is Little Pass island.

A sand bank and shoal water extends to the southward from Pass island, its 3-fathom limit bears from Junk Sail rock W.S.W., and narrows the channel to 5 cables.

Pass rocks, drying 20 feet, lie N.E. ½ E., 3 cables from Pass island, there is a narrow and deep passage between the rocks and the island, but it is not recommended.

Low island, 33 feet high, lying three quarters of a mile, N.E. ½. N. from Pass island, has a rocky ledge extending S.W., 1½ cables from it.

Ashuelot rocks consist of two pinnacles, lying east and west, distant 65 yards from each other. The western pinnacle has 4 feet over it at low water spring tides, with 6 fathoms close around, and bears N. 26 E. from the summit of Pass island, distant 6 cables, and S. 73 W.

* Owing to Station island sloping considerably as well as the great rise and fall of tide, it will appear nearly double the size at low, to what it does at high water.

† A quarter of a mile to the eastward of the white patch the P. and O. Company's steamer *Sunda* was beached and repaired. The fore part of the ship for 40 feet was dry at low water on November 12, 1875 (the day before full moon); the fore part of the ship was on hard white sand, and the after part on soft sandy mud.

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from the centre of Low island, distant 2 cables. The eastern pinnacle has $1\frac{1}{4}$ fathoms over it, with 6 fathoms close around. A detached rock with $3\frac{1}{4}$ fathoms over it, lies N.W. by N. half a cable from the western pinnacle; at low water these dangers are well marked by a heavy tide race.

Clearing Mark.—This foul ground should be carefully avoided. Station island kept open of the point inside Junk Sail rock leads through the channel westward of Ashuelot rocks. The channel in this part is 3 cables wide with 10 to 17 fathoms.

Quoin hill, 330 feet high, when on a westerly bearing does not represent its name, but on a northerly or southerly bearing it cannot be mistaken. At 6 cables, W. by S., from it is a remarkable steep hill, 962 feet high.

Flag island, 68 feet high, lies $1\frac{3}{4}$ miles, N. by W. $\frac{1}{2}$ W. from Pass island; reefs extend to the northward and southward of Flag island at a cable and $2\frac{1}{2}$ cables respectively, the east and west sides may be passed at a cable distant. Half a mile to the south-westward of this island are detached mud and sand banks forming the western edge of the entrance to Wilson channel.

Middle islands, lying N. by E. $\frac{3}{4}$ E., $1\frac{3}{4}$ miles from Flag island, are three in number, the westernmost being 61 and the easternmost 86 feet high.

At three-quarters of a mile S.W. $\frac{1}{2}$ S. from Middle islands is a group of rocks, the shoalest dries 8 feet.

Town point lies $1\frac{3}{4}$ miles E. by N. from Middle island, from this point the land trends to the eastward to Hai-tan-chin town. At $3\frac{1}{2}$ miles E. by N. from Middle island is a white sand hill, 171 feet high, N.W. $\frac{3}{4}$ N., $4\frac{3}{4}$ miles from this sand hill is Pillar rock, 90 feet high.

Tricker rock, drying 20 feet, lies S.W. by S., little more than one mile from Pillar rock.

Charles island, 50 feet high, N. $\frac{3}{4}$ W., $4\frac{1}{4}$ miles from Quoin hill. has a large boulder on the summit.

Rocky islands, 26 and 33 feet high, lie South, three quarters of a mile from Charles island.

Black rocks, 20 feet high, lie half a mile to the eastward of Charles island.

Tower rock, 28 feet high, situated 5 miles N. $\frac{1}{2}$ E. from Black rocks, is flat with a deep embrasure in it. A smaller rock lies one cable west of Tower rock.

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Three rocks, lying three-quarters of a mile from Tower rock, are 2 to 6 feet high, the eastern rock being the highest.

Cow's horn is a remarkable peak, rising to a sharp flat summit, on the west side of North entrance to Hai-tan strait.

DIRECTIONS.—South Entrance.—Having passed the dangers off Vangan point, and those projecting from the western face of Sand island, a vessel may work to the northward inside Chim island, westward of which are no dangers, except a rock at the entrance of Vangan inlet, which may be avoided by keeping 1½ cables off shore. On the south point of Vangan inlet is a walled town and pagoda. When abreast of this, Station island can be steered for, taking care to avoid the shoal water south-east of Young island.

South-east Entrance.—A vessel approaching this entrance from the northward, after rounding Hai head, will by passing 3 cables southward of Trite island, avoid South reef, which is 2 miles to the south of it.

Entering from the south-eastward, pass about a mile eastward of the Chim rocks, and when the northernmost rock bears W.S.W. one mile, steer about N.W. and W. (passing Chim island at 3 cables) until Junk Sail rock bears N. ½ W. or east point of islet east of Young island is in line with Quoin hill N.W. ¾ N., then steer N. by W. ¾ W. (midway between Pass and Low islands) which will lead clear of the dangers off Station island, and 4 cables west of Junk Sail rock.

After passing Junk Sail rock steer for Low island, until the east end of Junk Sail rock and the west end of Station island are in line, bearing S.E., with this mark on astern, steer N.W. until the east extreme of Little Pass island is in line with the west extreme of Pass island, S. by E. ½ E., when a N. by W. ½ W. course will lead one cable west of Flag island. Or if intending to pass east of Flag island, steer N. by E. for Middle island.

Since the date of Captains Kellett's and Collinson's survey in 1843, the channels north of Flag island have materially altered, Collinson channel (old channel) on the east having decreased in depth to 15 feet in the northern part, and a new channel; the Wilson; opened out on the western side of the strait with 18 feet* at low water springs. Between the two a middle ground 3 miles in length has grown up, with several dry patches on it. The shoalest parts of the bank are generally discoloured, but not invariably; under all circumstances Wilson channel is preferable.

* It is doubtful whether Wilson channel has decreased in depth since Commander Bullock's survey in 1866. The rise and fall of tide being now found to be 6 feet more than the approximate amount used at that time.

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Collinson (Old) channel.—If desiring to proceed by this channel pass Flag island, 2 to 3 cables distant, when it is two points abaft the beam steer N.N.W. ½ W. (or on the flood N.W. ½ N.) to bring the east end of Flag island touching the west end of Pass island S. ¾ E., this will lead in mid-channel.

When Sand hill is open north of Middle island group, bearing E. ½ N., steer to the eastward until the east end of Flag island is in line with west extreme of Little Pass island, S. ½ E. Keep this mark on astern, crossing the middle ground in 2¼ fathoms on a westerly course, when Pillar rock bears N.E. by N. (Tricker rock, if visible, will be in line with it) or Charles island in one with the Pagoda, S.W. by W. ¾ W., steer N. ¾ W., passing 4 cables west of Tower rock.

Wilson channel. — Passing a cable west of Flag island, steer N.N.W, Round island should then be ahead between Charles island and the Black rocks, this mark should be kept on until Town point is touching south end of Middle island, E. by N. ¼ N.

Then steer N. by W. ½ W. for eastern part of Black rocks, altering course to N. ¼ W., when Pagoda is in line with Rocky islands W. ½ N. Pass 2 cables east of Black rocks and 4 cables west of Tower rocks.

From the Black rocks Cow's horn in line with Slut island summit N. ½ W., should lead clear of all dangers to within a mile of the northern entrance.

Anchorages.—Good anchorage may be obtained in 4 fathoms, sand, with Station island bearing E. by N. ½ N. and Junk Sail rock N.N.W. ½ W.

In Myangkun bay in 6 fathoms, mud and sand, with Junk Sail rock and Low island in line S.S.E. ½ E. and Hill island summit N. ½ E.

In the northern end of Wilson channel, anchorage will be found, in 7 to 10 fathoms mud and sand.

Tides.—It is high water, full and change, in Hai-tan strait, during the N.E. monsoon at 11h. 15m.; springs rise 20 to 23* feet, neaps 16 feet. The flood stream entering Hai-tan strait by the south-east entrance, bifurcates north of Chim island, one portion flowing north-westward, and the other south-westward. The latter stream again divides south of Volga rock, one part meeting the main tides by Hungwha channel, the other reaches Lam Yit channel by the numerous passages between Rugged and Lam Yit islands. Steam vessels of moderate power should be prepared with full steam when entering the channels between Rugged and Red Yit islands, on the flood tide, which runs 5 to 6† knots an hour at springs, but sets

* The rise at full moon spring tides was found to be greater by 3 feet than at new moon spring tides.

† H.M.S. *Nassau* experienced a tide of 6·8 knots in the passage north of Wilshere island.

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fairly through the passages; heavy tide races, and chow-chow water will often be experienced.

During March and April, at the Sedan rock, the flood ran S.W. and ebb S.E. 2 to 2½ knots an hour.

At 1½ miles north of Turnabout, four days after new moon, with a light south-west wind, the tide set north-east for 19 hours, 2 to 4 knots an hour; and to the south-east only 3 hours, one knot an hour.

In March, off Tan point, the flood set S.W. and ebb N.E., 2 to 2½ knots per hour. Between Red Yit island and North Yit rock, an eddy tide was experienced, the flood running N.E. and ebb S.W., 2 to 3 knots an hour.

The flood stream entering by the northern channels meets the stream from the southward, between Rocky and Middle islands. With strong winds, heavy overfalls, dangerous for boats will be found in the channels in this vicinity and more especially between Hill and Middle islands.

In the Pass, the tide runs in the direction of the channel 4 to 5 knots an hour, but in the more open portions of the strait, from 2 to 3 knots.

Position.—The position of the observation spot at Station island is lat. 20° 25′ 16″ N. and long. 119° 42′ 22″ E., depending on Wellington battery, Hong Kong, being in 114° 10′ 02″ E.*

Supplies.—In most of the villages in Hai-tan strait, fowls and eggs can be obtained, and bullocks can generally be bought at moderate prices, by giving forty-eight hours notice.

Water.—There is no good watering place in the strait, but water is found on the mainland and in the majority of the large islands (Middle island being one of the best). Water from the neighbourhood of cultivated land or from streams flowing through it, should be carefully avoided.

During the winter months, wild fowl will be found on the island lagoons and in the large shallow bays which indent the coast.†

TESSARA ISLANDS are a group of four islets lying N.N.E. 6 miles from Slut island; between them and the Cow's horn the depth is 6 fathoms. The long swell which set into the bay prevented the *Plover* anchoring, and giving these islands as well as the islets to the eastward that close investigation that could have been wished. The only conclusion arrived at was that there was nothing here sufficienty extensive to shelter

* Wellington battery was in 114° 9′ 56″ E. longitude, therefore a correction of − 5″·5 should be applied to the position of observation spot, Station island.—Deduced from the Telegraphic Determination of secondary meridians by Lieut.-Commander Green, U.S.N., 1883.

† The directions for Haitan strait are chiefly by Navigating Lieut. J. Whitly Dixon, R.N.

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a vessel in the N.E. monsoon. A reef extends S.S.E. 3 cables from the easternmost islet. Brown rock, north-westward of Tessara, is 90 feet high, and cleft in two.

Caution.—It cannot be considered safe for large vessels to pass by any of the channels inside the Tessara islands. That between Cow's Horn point and Fairway island, is not reputed safe by the pilots, and in that between Fairway and Tessara, which they always use, H.M.S. *Hornet* struck* on a rock 500 yards off the west end of the latter island, the soundings being 5 to 6 fathoms. Whenever small craft do pass this way, mid-channel courses between the islands and reefs should be carefully kept.

RED ROCK is a small islet with reefs about it, lying S.E. by S. 3 miles from Tessara islands. Vessels should not close the Hai-tan shore to the eastward of this rock, as the intervening space between it and the Warning rocks (which are about 80 feet high and lie 7 miles to the eastward) is strewn with reefs.

NORTON ROCK, about 50 feet high with a rock awash half a mile westward of it, lies East 6½ miles from Tessara islands.

WHITE ISLAND.—At 7½ miles northward of the Tessara is the southernmost of a group of rocks and shoals, which extend all the way to Sand peak point. Junks anchor under the largest, White island; but there is almost always a heavy ground swell setting into this bay. A sandy beach extends from the Cow's Horn to Sand peak, a distance of 16 miles, and a vessel may stand towards it until the group just described is reached, which it will be advisable to keep outside of, taking care to avoid a rock lying 9 cables eastward of White island.

SAND PEAK.—Under Sand peak the banks at the entrance of the river Min commence; 3 fathoms will be found at 2 miles off shore, and boats may find their way into the Min by the channel between Sand peak and Woufou island, but the navigation even for them is difficult, and entirely impracticable (if the channel described on page 324 be not known) to any but of such light draught as can go over sands that dry at low water. This, however, when the tide will admit, will be found the best channel for a vessel lying at the White Dogs to communicate with Fu-chau fu. There is a large fishing establishment under Sand peak.

TURNABOUT ISLAND (about 218 feet high) lying E.S.E. about 4 miles from Hae head, in lat. 25° 26′ N., long. 119° 58′ 42″ E.,

* The vessel glanced off the rock, and the following bearings were taken immediately after:—Brown rock, N. 34° W.; Fairway reef, S. 13° W.; Cow's Horn, S. 62° W.

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has two small islets off it, and there are dangerous rocks off its northern and southern points.

Sunda rock, drying 3 feet at low water spring tides, bears North from the northern extremity of Turnabout island, distant 3½ cables, with foul ground inside.

A rock, awash at low water spring tides, lies South of the south point of Turnabout island, distant 1½ cables.

Vessels navigating in this vicinity should not approach Turnabout island within three quarters of a mile. The lighthouse keepers on Turnabout island report that several steam vessels have been hazarded by rounding the south point of the island too closely.

LIGHT.—A *fixed* white light is exhibited from a lighthouse, 54 feet in height, on the summit of Turnabout island, visible all round. It is elevated 257 feet above the sea, and should be seen, in clear weather, a distance of 23 miles. The illuminating apparatus is dioptric, of the first order. The tower, which is of stone, is painted black, and the keepers' dwellings and surrounding walls white.

Fog Signals.—In thick or foggy weather, when a vessel is known to be in the vicinity, two guns will be fired at *three* minutes interval between; to be repeated if necessary after a further interval of *ten* minutes.

WHITE DOG ISLANDS, called by the Chinese Pih-keun, are 22 miles N.N.E. ¼ E. from the peak of the Kiangshan hills on Hai-tan island, and 8½ miles S.E. of the entrance of the river Min. They consist of two large and one smaller islet, named Middle Dog, South Dog, and Tong-sha island.*

Tong sha, the western island, and the largest of the group, has a reef of rocks running off its west extreme, terminated by a square islet called the Breakwater; and a half tide rock lies a cable from the western point of Village bay, on the south side of the island. The highest part of the island is flat topped, and 590 feet above the sea. Fresh water may be obtained in small quantities.

Rocks and reefs extend both northerly and westerly from the Middle Dog, but the outer ones always show; a rock on which the sea generally breaks lies N.E. by E. ½ E. $1\frac{1}{10}$ miles from its north-east point. The channel between Middle Dog and Tong-sha is safe. The islands are inhabited by a few fishermen.

LIGHT.—A light is exhibited from a tower erected on the north-east end of Middle Dog Island. It is a *fixed* white light, varied by a

* *See* Admiralty Chart of river Min, with views, No. 2,400, scale, $m = 1 \cdot 2$ inches.

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bright flash every half minute, visible all round, except to the westward, where it is intercepted by the higher ridges of the White Dogs. It is obscured by Tong-sha when bearing between E. by S. ¾ S. and East; by the northern hill of Middle Dog when between E. ¾ N. and N.E. by E. ½ E.; and by the southern hill of the same when between N.E. by E. and N.E. ½ N. It is elevated 257 feet above the sea and in clear weather should be seen from a distance of 23 miles. The tower is round, built of stone, 64 feet high, and painted white, the light keepers' dwellings and boundary walls are white also.

The illuminating apparatus is of the first order, dioptric.

Fog Signals.—In thick or foggy weather, when a vessel is known to be in the vicinity; *three* guns will be fired with an interval of *two* minutes between them; to be repeated, if necessary, after a further interval of *fifteen* minutes.

ANCHORAGE in the N.E. monsoon, for vessels of any draught, will be found under Tong-sha island. Small vessels will be well sheltered in 18 feet, close under the Breakwater, and here whole fleets of Chinese junks remain during foul weather. As the water decreases gradually towards Tong-sha, large vessels may approach as convenient, bearing in mind that the rise and fall is 18 feet. H.M.S. *Cornwallis* anchored here for five days, with strong north-easterly winds, and rode easy, with the Breakwater bearing N. ½ W., the village N.N.E., and the Middle Dog E. ½ S.*

DIRECTIONS.—The passage from Lam-yit to White Dog islands may be considered as the most difficult portion of the coast that a vessel has to contend with in the N.E. monsoon, and it is believed there are few men who know the coast of China but will allow that Turnabout island (page 234) is well named. The attempt of the flood to force its way through Hai-tan strait forces the water back, and occasions a strong current off Kwing bay, at the north-east end of Hai-tan. This bay does not afford safe shelter, being full of rocks, with a heavy swell usually rolling in; but secure anchorage may be found under Hai head.† The other alternative for sailing vessels is to stand boldly off and trust to a slant on the Formosa side (page 291), or take the Hai-tan strait. The open sea is, however, preferable, unless with a commanding wind, and a handy vessel; to prevent great detention.

THE COAST to the northward is described, and directions for the river Min are given, in chapter VI. page 314.

* The bearings given show that the south extreme of Middle Dog is here meant.

† *See* plan on Admiralty Chart, channels between Red Yit and Rugged island. No. 818.

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PESCADORES ISLANDS.*

The Pescadores or Ponghou archipelago consists of twenty-one inhabited islands, besides several rocks, and extends from lat. 23° 11½′ to 23° 47′ N., and from long. 119° 16′ to 119° 40′ E. From their basaltic formation the land is generally flat, and no part of the group is 300 feet above the level of the sea. Ponghou and Fisher, the two largest islands, lie near the centre of the archipelago, and between them is an extensive and excellent harbour. The general depth of water on the western side of the archipelago is 30 and 35 fathoms; there are, however, some places with 60 fathoms. To the eastward of the group the depth is 40 fathoms, and the current strong.†

Most of the islands have green tops, being terraced for cultivation on every available side. Potatoes, maize, millet, and ground nuts are produced in considerable quantities, as well as a few other vegetables, but the soil is not good, being chiefly light sand mixed with the débris of coral. Owing to the violence of the north-east winds, prevalent more than half the year, there are no trees, but the islands are well supplied with fruits and vegetables from Formosa. Bullocks are numerous, being used to till the ground. Fresh water was abundant in the months of June and July, but it was stated that at some seasons it was scarce. H.M. brig *Plover* watered from a well at Ponghou that yielded 3 tons daily. Dried fish forms the only article of export, and the imports are rice, sugar, fruits and vegetables from Formosa, tea, &c., from Amoy.

The inhabitants, who are poor and ill-fed, support themselves by fishing, and seem to live chiefly on fish and sweet potatoes; they are a harmless, inoffensive race.‡

JUNK ISLAND, the most southern of the Pescadores, is 2 miles long, east and west, and 1½ miles wide, and the soundings in its vicinity are 15 and 16 fathoms. The highest part of the island is 260 feet above the sea, and from it, High island bears N.W. ½ N. 8¾ miles, Reef island N.E. by E. 5¼ miles, and East island E. by N. 13 miles. A reef of rocks extends 6 cables from its south-west side, and within them is a small artificial harbour for junks. Its eastern face is fronted by bold cliffs; and its western extreme is a long shelving point.

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* Navigating Lieut. C. Jeffery, of H.M.S. *Mosquito* (1879), remarks:—That from having generally the same characteristics these islands are difficult for a stranger to recognise in heavy weather. Coming from Amoy the first land made will be Triangle island (the most northern part of Fisher island). It has an obelisk on the top, and terminates in a bluff.

† *See* Admiralty Chart of Pescadores islands, No. 1,961; scale, $m = 0{\cdot}8$ of an inch.

‡ Vice-Admiral Sir Chas. F. A. Shadwell, K.C.B., F.R.S., 1873.

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REEF ISLANDS are three in number, one of which, Steeple island, is a remarkable pyramid. The other two are rather more than a mile each in circumference, and are connected at low water by a stony ledge; reefs extend half a mile to the southward of them, and one mile and a third S. by E. ½ E. from the south-east end of the eastern island is a pyramidal rock 80 feet above the sea. There is also Low flat rock, nearly level with the water's edge, lying S.W. by S. 1¾ miles, and a small flat-topped rock about 9 feet high, with a reef northward of it lying S.E. 2 miles from the east end of this island.

EAST ISLAND is 8 miles eastward of the Reef islands, and between them and distant 5 miles from the latter is a smaller island, Pe-ting, 1½ miles in circumference, with a reef extending in an easterly direction, not quite a mile from its north point. East island is 2½ miles in circumference, and a small islet lies half a mile from its north-western shore. A reef awash at high water extends one cable E.N.E. from the north-east extreme of the island, and South from the same point about half a cable. There does not appear to be any navigable channel between East island and the small island to the north-west of it; the passage appears barred by a reef. Vessels should not approach East island within a distance of 3 cables.

NINE FEET REEF lies N. by E. ¾ E. 12¾ miles from the north end of East island, and from it Dome hill on Ponghou island bears W. by N. ½ N. 10¾ miles, and Three island N.N.W. ½ W. 4 miles. The lead gives no warning, but if there be any tide running, the ripple will be sufficient to point out its position.

ROVER GROUP, consisting of two large islands, Pa-chau and Tsiang, and several rocks, are sufficiently extensive to afford shelter under their lee in either monsoon. The general depth is 7 and 8 fathoms on the southern, and 13 and 14 fathoms on the northern shore.

Pa-chau, the western island, is 2½ miles long, north and south, and one mile broad, and its summit rises like a dome with a large pile upon it. A reef extends 1⅔ miles in a westerly direction from the south-west point of the island, and its extreme shows at all times of tide. There is also a reef which covers at high water, bearing W. by S. ¾ S. from the summit, and lying 2 cables from the shore. The north-west point of the island is not steep-to; and a rock, which always shows, lies off the north-east point, having a channel 4 cables wide between it and the point.

Tsiang, the eastern island, is only 1¼ miles long N.E. and S.W., and about 1½ miles broad, and the channel between it and Pa-chau is barely one cable wide. The east point of this island is remarkable from an isolated

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cliff, called Rover Knob, 100 feet high, which forms the most striking feature in the group; and 7 cables eastward of the cliff is a ledge of rocks, parts of which are always above water.

DIRECTIONS.—The channel between the Rover group being so narrow and intricate, the only excuse for a stranger using it would be his vessel being caught at anchor to the northward of the group in a breeze from the northward, and unable to fetch clear either eastward or westward. On the north-west face of Tsiang are two islets, under the southern of which a small vessel might find shelter in a northerly wind, taking the precaution not to stand too far into the bay, as there are only 6 feet water at 2 cables off shore. On the west end of the island, which is a cliff, are three embrasures.

In the centre of the southern part of the channel is a small rock with a reef extending southward half a mile from it. The passage out is eastward of this rock, and the channel is a quarter of a mile wide. E. by. S. 4½ cables from the small rock is a reef which may always be detected from the mast head, as well as two other patches lying respectively 4 and 7 cables eastward of it.

HIGH ISLAND, bearing W. by S. ⅔ S. 9¾ miles from the highest part of Pa-chau, is dome shaped, 247 feet high, and three-quarters of a mile in circumference. At one mile eastward of it is a low flat island, and between the two are several rocks, one of which has a remarkable gap in it, and rises 60 feet above the sea. A rock nearly level with the water's edge lies S.E. ¼ E. 1¾ miles from the summit of High island.

YIH-PAN ISLAND, 158 feet high, 2 miles in circumference and uneven in appearance, is 4 miles northward of High island, and S.W. ½ S., 11½ miles from the lighthouse on the south-west end of Fisher island.

TABLE ISLAND, bearing S.S.E. ¾ E. nearly 5 miles from the lighthouse on Fisher island, is aptly named, the summit being a dead flat 200 feet above the sea; near its south-west end is a sudden fall nearly to the sea level, giving it at a short distance the appearance of two islands. The island is not quite 2 miles long, E. by N. and W. by S., and is seldom 3 cables wide. The 2-fathoms' line of soundings extends 2 cables from its eastern extreme.*

Water.—There was a good run of water in the month of June towards the north-east end of Table island.

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* Table island is conspicuously basaltic, the basalt, of a dark hue, being disposed side by side like slates, a bundle of them peaking out on one side near the top.—*Robert F. Swinhoe*, Esq., H.M. Consul.

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TABLET ISLAND is about a mile northward of Table island, and between them the depth is 12 to 19 fathoms.

A shoal with only 9 feet water extends N.W. ½ W. 1¼ miles from the north-west side of the island, and from its south-west edge, in 4 fathoms, the south end of the island bears S.E. ½ E.; from its north-east limit the north point of the island bears S.E. by E.; and from its north-western limit Dome island bears N.E. by E. ¾ E.

FISHER ISLAND, which, in a collection of voyages in Dutch published in 1726, is called D'Visser's island, lies westward of Ponghou, and between them is the excellent and extensive harbour of Ponghou. The island is 5 miles long, north and south, and 3¼ miles broad. The south-east point, Siau head, is a bold cliff 170 feet above the sea. A reef in the form of a horse-shoe, and having a depth of 3 fathoms, lies a quarter of a mile off shore, westward of Litsitah point (west point of island). There is apparently deep water between the reef and the shore, but it would be dangerous to pass between. This reef is plainly visible from the lighthouse, and occasionally there is a heavy overfall: there is also a second reef which breaks at low water 7 cables from the western shore of the island, and its outer extreme bears N. by E. ¼ E. from the lighthouse on the south-west extreme of the island, which is described below.

Anchorage.—Vessels seeking shelter in a north-east gale will find smooth water off the southern shore of Fisher island between the lighthouse and Siau head, where there are two sandy bays; in the eastern bay is a fort or line of embrasures, and in the western a run of fresh water, except during the dry season.

Niu-Kung bay, between the north end of Fisher island and Pehoe island, will afford shelter in the S.W. monsoon. The north-east point of the former island is a table bluff with reefs, which cover at high water, extending 2 cables in a north-easterly direction from it.

PONGHOU ISLAND, the largest of the Pescadores, is 9½ miles in extent, north and south; it is, however, separated into three portions by narrow channels, which have only 2 feet in them at low water, and are further blocked by stone weirs. The whole of the western face of the island is fronted by coral reefs. On its south-eastern side, between Hou and Leechin points, are two bays with fishing villages, either of which afford anchorage in the N.E monsoon. The best shelter will be obtained in the northern bay of the two, as it is protected by some rocks, the reefs lying off which may be seen from the mast head, as the water is very clear. Dome bay, on the south-west side of the island, also affords good anchorage in 6 fathoms.

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PONGHOU HARBOUR.—The eastern coast of Fisher island trends northward from Siau head, and forms several small bays which are steep-to at a cable from the beach until 2¼ miles north of the head, when reefs extend nearly 3 cables off shore. To avoid these reefs the fall of Siau head must not be brought southward of S. by W. ¼ W. after Makung citadel opens northward of Black rock, which lies N.E. ¾ E. 1½ miles from Siau head, and part of it is always uncovered. When passing eastward of this rock, keep within 4 cables of it, as coral patches extend some distance from Ponghou.*

The *Plover* anchored about 3 miles northward of Siau head, with Black rock S. by E. ¾ E., and the highest part of Tatsang island E. ½ N.; in the bay abreast her were two runs of good fresh water. In working up for this anchorage, to avoid the coral reefs extending from the Ponghou shore, do not stand farther eastward than to bring Black rock S.S.W. The harbour northward of this anchorage is much choked with coral patches. There is a passage out to the northward between Fisher island and Pehoe island, and it may be used on an emergency by vessels of 15 feet draught, but a local knowledge is necessary to render it available.

LIGHT.—A *fixed* white light is exhibited at 205 feet above high water, from a lighthouse standing on Litsitah point at the south-west extreme of Fisher island; it should be seen in clear weather from a distance of 15 miles. The illuminating apparatus is of the fourth order, dioptric.

The light tower, 33 feet high, is round, built of iron and painted black: the keepers' dwellings are painted white.

Fog Signals.—In thick or foggy weather, when a vessel is known to be in the vicinity. *Two* guns will be fired with an interval of *five* minutes between them; to be repeated if necessary after a further interval of *ten* minutes.

Position.—Latitude 23° 33′ N.; longitude 119° 28′ E.

MAKUNG HARBOUR is formed at the south-west part of Ponghou, and although much confined by coral reefs it has sufficient depth for vessels of large draught. The town of Makung stands on the north side of Junks bay, close to the north-east point of entrance, and will be easily recognised by a citadel and a line of embrasures. The large junks waiting for a favourable wind to take them to Formosa, anchor south-west of the town in 7 and 8 fathoms, with Black rock, lying midway between Fisher island and Makung, bearing N.E. by N. The junks

* Vice-Admiral Shadwell reports, (1873,) that this harbour affords good shelter during the N.E. monsoon, but is only fairly protected from the wind at other quarters.

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belonging to the place lie close to the town, in a creek north-eastward of the citadel. The most convenient anchorage is in 8 fathoms, between the old Dutch fort and Observatory island, a little within the line joining them. The harbour is a safe one, and quite sheltered in typhoons.

The harbour runs back 3 miles to the eastward from Chimney point, the south point of entrance, on which is an old Dutch fort. The southern shore is low, and on Dome hill, which is 154 feet above the sea, and the highest part of the land hereabouts, is a large pile of stones; the land between the hill and chimney point is low and in two places less than a cable across. Dome hill overlooks Dome bay, on the south-west face of the island, in which is a village and a fort. The isthmus immediately eastward of the village is low enough for the sea to break over at high water during a south-east gale. The *Plover* anchored with Chimney point bearing N.W. $\frac{3}{4}$ W. distant 6 cables, which is also the width of the harbour here.

Coral Reefs.—Within the harbour are four coral patches, awash at low water springs, small in extent, and steep-to, but they may always be detected from the mast head in time to avoid them. From the westernmost patch Chimney point bears N.W. by W. $\frac{1}{2}$ W. and Dome hill S. by E. $\frac{1}{4}$ E. The next patch lies a quarter of a mile farther eastward, with the fort on Chimney point N.W. by W. $\frac{1}{4}$ W. and Dome hill South. From the next patch the fort bears N.W. $\frac{1}{2}$ W., and the hill S. $\frac{1}{2}$ W.; and from the fourth patch the fort bears N.W. $\frac{1}{2}$ W., and the hill S.W. by S.

DIRECTIONS.—Running for Makung harbour from the westward, pass about half a mile southward of Litsitah point, the south extreme of Fisher island, and then steer E. $\frac{1}{2}$ N. for the town of Makung, which, as before observed, may be recognised by a citadel and a line of embrasures. The only dangers to be avoided in entering this passage are, the shoal with 9 feet on it, extending N.W. $\frac{1}{2}$ W. $1\frac{1}{4}$ miles from Tablet island; and a reef, just awash at high water, at half a mile westward of Dome island. Flat island, lying 2 cables westward of Chimney point, is also surrounded by reefs to the distance of a cable from high-water mark; and shoal water extends three-quarters of a cable in a northerly direction from Chimney point.*

TORTOISE ROCK, 9 feet above water and steep-to, lies about $2\frac{1}{4}$ miles from the north-west point of Fisher island, and N. by E. $\frac{1}{2}$ E. $7\frac{1}{3}$ miles from the lighthouse. There is a shoal patch of $1\frac{3}{4}$ fathoms at

* According to information received from Captain Klausa, a beacon, pyramid shaped, 26 feet high, and built of stone, stands on the middle of Flat island (approach to Makung harbour). It forms an excellent landmark when making the harbour, but must not be brought to bear northward of East.—Berlin Notice to Mariners, No. 8, of 1883.

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6 cables S. $\frac{3}{4}$ E. from the rock, and N.W. $\frac{3}{4}$ N. from the north-east point of Fisher island.

SAND ISLAND, three-quarters of a mile long, north and south, and a quarter of a mile broad, bears N.E. by E. $\frac{1}{4}$ E. $2\frac{3}{4}$ miles from Tortoise rock, and it will be known by a hummock which rises on the low land in the centre of the island, and also by its yellow appearance; a rock lies off its south-west end and reefs extend north-westward 3 cables from its north-west point. At half a mile eastward of this island is a flat black islet, and northward of it a cluster of stones, some of which are always above water.

BIRD ISLAND bears E.N.E. from Sand island, and a long sandy point, off which is a small sand island with a house upon it, forms its southern extreme. On the west point is a low hill connected with the rest of the island by a sandy isthmus.

Shoal water extends 3 miles northward from the north point of Bird island, and near its centre is North island, which has a house upon it to shelter the fishermen, and upon a reef half way between them is another house. The northern edge of the shoal water uncovers at low tide, bearing from N.N.W. $\frac{1}{2}$ W. to N. $\frac{3}{4}$ W. from North island distant $1\frac{1}{10}$ miles; and from the reef at its west extreme, which is steep-to (for the lead gives no warning), Sand island bears S. by W. From the west point of Bird island to this reef are many reefs which will be avoided by not bringing Sand island westward of S. by W.

ANCHORAGE.—Shelter during a north-easterly wind might be found on the west side of Bird island; and from southerly winds, to the northward of the reefs extending from the north point of the island.

N.W. OUTLIER is a shoal patch of 5 fathoms, lying N. by W. $\frac{3}{4}$ W. from Sand island and West $3\frac{3}{4}$ miles from North island.

SABLE ISLAND, bearing S.E. by S. 5 miles from the north-east end of Bird island, is a small islet with a sand patch on its south cliff, and surrounded with rocks. It is nearly connected with the two Conch islands southward of it, by reefs at low water; the southern island of the two has a large village on it.

ORGAN and RAGGED ISLANDS.—Organ island is three miles S. by E. $\frac{1}{2}$ E. from Sable. N.E. $\frac{3}{4}$ N. one mile from it is a reef, from which Sable island bears N.W. by N. Ragged island is nearly a mile S.E. by E. from Organ.

The whole of the east coast of Pehoe and north coast of Ponghou abreast the above islands is shoal.

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ROUND and THREE ISLANDS.—Leechin point, the east extreme of Ponghou, is low and shelving, and $1\frac{3}{4}$ miles eastward of it is Round island, bearing S. by E. $\frac{3}{4}$ E. $3\frac{1}{2}$ miles from Ragged island; and S. $\frac{1}{4}$ E. $1\frac{1}{4}$ miles from Round *is* Three island. N.W. by W. $\frac{3}{4}$ W. from Three, and S.W. $\frac{1}{4}$ S. from Round island, is a reef which covers at half tide. Between Round and Organ islands are several overfalls.

NORTHERN GROUPS.—The archipelago, to the northward of Fisher and Pehoe islands, does not afford any inducement for a vessel to enter it. The external dangers have, therefore, only been noticed.

TIDES.—It is high water, full and change, in Makung harbour at 10h. 30m.; springs rise $9\frac{1}{2}$ feet, neaps 7 feet. The tidal streams among the Pescadores run with great strength, but they are much affected by the prevailing winds. H.M. brig *Plover*, during the southerly monsoon in August, sometimes experienced a stream of 4 knots per hour on the flood running to the northward,* whilst on the ebb, the current slackened for two and three hours, but seldom ran with any velocity to the southward. Vessels therefore navigating in this neighbourhood may safely allow that the effect of the current and tidal stream together will set them, according to the prevailing monsoon, 17 miles in one tide. Tide races are common, and overtop with great violence.

FORMOSA BANKS occupy a large space on the charts to the southwest of the Pescadores, but as they have not been surveyed and there is at present no account of them, they should be approached with great caution. They trend in the direction of the Pescadores channel and have general depths of 5 to 10 fathoms water. During the summer months the S.W. monsoon drift current causes tide-rips, eddies, and whirls on the banks between Swatow and Takau.

There appears however to be much less water over these banks, for Captain Livingstone, of the ship *Sea Star*, of Glasgow, reports† that his vessel struck the ground in lat. 23° 19′ N., long. 118° 53′ E., and carried away part of her keel; the depth he considered to be about 15 feet, and High island bore E. $\frac{1}{2}$ S. distant about 20 miles. This statement has been subsequently confirmed‡ by Mr. Turner, of the P. and O. Company's ship *Pekin*, who, in passing near this locality in December 1861, observed the sea breaking as near as possible in the above position; and he warns all vessels from approaching it at night during the N.E. monsoon, as the

* The same was observed in H.M.S. *Serpent*, in May 1866, when anchored during four days in the Pescadores channel; the S.W. monsoon was not then established. *See* also pages 26 and 291.

† Nautical Magazine, p. 54, January 1858.

‡ Mercantile Magazine, p. 128, April 1862.

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breakers might be taken for phosphorescent water till too late to avoid the danger.

Mr. George Stanley, R.N., who carried soundings many times across these banks between Amoy and southern Formosa, makes the following remarks. "Considering the limiting edges of the Formosa banks to be a depth of 20 fathoms, their northern edge will be in lat. 23° 18′ N., long. 118° 25′ E., and their eastern side in the parallel of 22° N., and long. 119° 15′ E. The western edge of the banks can scarcely be delineated as it stretches from the Lamock islands without any marked irregularity of depth. The shoalest part* 5 fathoms, is in lat. 23° 1′ N., long. 118° 29′ E. The banks are formed of coarse white sand, with patches of from 7 to 10 fathoms water on them, which all lie between the parallels of 22° 40′ and 23° 15′ N., and between the meridians of 118° 10′ and 119° E. When sailing slowly through the water and sounding, it was frequently found to shoal suddenly from 18 to 8 fathoms, increasing in depth again as rapidly. Heavy overfalls generally indicate these sudden variations in depth. Fish in large shoals were seen in the months of April and May. The current during those two months was generally found setting to the N.E. one mile an hour, increasing in strength as the coast of Formosa was approached."

PESCADORES CHANNEL, formerly called Formosa channel, lies between the Pescadores, and Formosa 20 to 30 miles to the eastward. It is 20 to 60 fathoms in depth, and narrowed to a breadth of 9 miles between outer Wanckan shoal and Nine-feet reef which lies W. by S. ¼ S. from Wanckan, and which is 4 miles S.S.E. ½ E. from Three island, the easternmost islet of the Pescadores group.

TIDES.—In the centre of the Pescadores channel, eastward of Ponghou, the tidal streams were observed, early in 1866, to set as follow:—At high water by Makung, the northern stream, which had then been running for 9 hours, ceased and was succeeded by 3 hours slack water, after which the northern stream again made. Its velocity was 2 to 3 knots an hour, with a maximum of 4 knots at half-stream. Large eddies were formed by the current which covered the sea with discoloured patches, shewing that it swept the bottom at a depth of 22 fathoms; and the temperature of the water was 10° higher than at Makung harbour. Further observation is required to determine whether this condition of the tidal streams is permanent or variable, or whether it changes according to season, or is reversed at any period of the N.E. monsoon. It is well

* This was the least water found by H.M. surveying vessels *Swallow* and *Dove*. The banks were not regularly surveyed, but only crossed from shore to shore by dead reckoning.

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known that a warm current, which is either the S.W. monsoon-drift or a branch of the Japan stream, flows up this channel during the spring and summer months, but precise information concerning it has yet to be ascertained. It is well therefore to record the following remarks.* "On the N.W. coast of Formosa the ebb stream was invariably found running strong to the north-eastward, whilst the effect of the flood, even during strong breezes, was scarcely perceptible. On the ebb, tide-races with very dangerous, confused sea exist off all the points of the north-west coast of the island, and also to the northward of Tamsui, the worst of which is off Syau-ki point. Here, on one occasion although there was but little wind, the *Havoc*, under steam, lost all steerage way until drifted up to Foki point where it became comparatively smooth. It was considered that the effect of the northern current had been under-estimated."

* Remark Book of Mr. John F. Barns, R.N., H.M. Gunboat *Havoc*.

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CHAPTER V.

FORMOSA AND ADJACENT ISLANDS AND STRAITS,

INCLUDING THE PRATAS AND OTHER REEFS; THE NORTHERN COASTS OF LUZON; BASHEE AND BALLINTANG CHANNELS; BABUYAN AND BATAN ISLANDS; EAST AND WEST COASTS OF FORMOSA; AND ISLANDS NORTH AND EAST OF FORMOSA.

VARIATION in 1884.

Pratas Island, 0° 30′ E.; Bashee Islands, 0° 15′ W.; Meiaco Sima Group, 1° 20′ W.; Takau, Formosa, 0° 30′ W.; Kelung Harbour, 1° 10′ W.

The present chapter deals with a region embracing within its limits some of the ocean highways to and from southern China. Ships bound thereto by the eastern route or passages, pass southward of Formosa through the Bashee or Ballingtang channels; those to northern China pass through or near the groups of islands lying to the north-east; the passage east of Formosa is made by sailing vessels bound from southern China to the northern ports or to Japan, against the N.E. monsoon; and that west of Formosa is often found preferable to proceeding by the coast of China. Directions for making these passages, with the prevailing winds and currents, are given in the first chapter of this work, on pages 39, 49.

PRATAS ISLAND and REEF.*—Pratas island, the north-east end of which is in lat. 20° 42′ 3″ N., long. 116° 43′ 14″ E., rises from the west side, and near the middle of the sunken part of the Pratas reef. It is about 1½ miles long, E. by S. and W. by N., half a mile wide, and 40 feet high, of which elevation the scrubby bush, with which it is covered, forms about 10 feet. It is composed of sand, not a particle of mould or earthy matter could be found on it, its shape is that of a horse-shoe, enclosing a shallow inlet or lagoon, which runs into its western side for about half a mile, and must afford shelter to the Chinese fishermen who come here to fish in the early part of the year. Brackish water can be obtained by digging a few feet into the sand. Gannets are numerous, and may be knocked down with sticks.

The island is visible at a distance of 9 or 10 miles, in clear weather from the deck of a large vessel; from the westward it will make like two

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* Surveyed and described by John Richards, Master R.N., April 1858. *See* Admiralty Chart, China sea, Sheet 4, Mindoro strait to Hong Kong, No. 2,661; scale, $m = 0{\cdot}05$ of an inch.

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detached but contiguous islets, the centre being lower than the ends. It is visible when near the south extreme of the reef, but more conspicuous when approaching it from the westward or northward.

Pratas reef, the north-east point of which is in about lat. 20° 47′ N., long. 116° 53′ E., is a coral barrier of nearly circular form, encircling a lagoon of 5 to 10 fathoms water, and thickly studded with coral knolls round its margin, but comparatively clear near the middle. The reef is about 40 miles in circumference, one to two miles broad, and slightly flattened on the northern side. Nearly two-thirds of it, or the north, east, and south sides, are just dry at low-water springs, the remainder, or western side, forms a sunken barrier, across which are two channels leading into the lagoon, one on each side of Pratas island. The north channel is about 3 miles wide, between the island and the edge of the breakers, and 3 fathoms may be carried near the middle of it at low-water springs. The south channel is by far the best of the two, from its being wider, a little deeper, as well as its comparative freedom from coral knolls.

TIDES.—During the survey of Pratas reef, April 1858, it was high water, full and change, at about 4h. a.m.,* and the rise was about 5 feet. There was only one perceptible ebb and one flow in the 24 hours at the springs. The highest tide occurred on the third day after the full moon, but the tides were very irregular.

ANCHORAGE.—Although Pratas reef is steep-to in most parts, there are several spots where, in case of necessity, a vessel might find anchorage outside the breakers, particularly on the west side, abreast the middle of the channels through the sunken part of the reef, and at the distance of about 1½ or 2 miles on either side of the island. At each of these spots there is good anchorage in the N.E. monsoon, in 20 to 10 fathoms, but the position abreast the south channel is considered the best, the sunken reef at this part being deeper and the bottom more even than in the channel north of the island. A vessel of light draught might even anchor in safety *on* the reef, in the middle of the south channel in 3½ fathoms at low water, or cross it and take up a berth inside the lagoon in 10 fathoms fine sand.

Captain Ross, I.N., visited this reef in the *Discovery*, with the *Investigator* in company, August 1813. The first soundings obtained were 74 fathoms, fine coral, about 1½ or 2 miles from the north-east point; from thence the former vessel steered along the north side, about three-quarters of a mile from the breakers, in soundings of 31 to

* Other observations are at variance with this. The establishment is probably 6 h. or 7 h.

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38 fathoms; the *Investigator* keeping about a quarter of a mile off, had great overfalls of 10 to 24 fathoms. After rounding the north-west part of the reef about a mile off in 35 fathoms, rocky bottom, they anchored in 24 fathoms, about 1½ miles from the west end of the island with the island bearing from S.E. ¼ S. to E.S.E. About half-way between this position and the shore the depths were 4 and 5 fathoms, and then very shoal water.

H.M.S. *Highflyer*, in May 1857, anchored about 8 cables from the west end of the island, in 20 fathoms, coral and clay, the extremes bearing S.E. ¾ E. and E. by S. She also anchored, with stream anchor, at half a mile from the south-east edge of the reef, in 32 fathoms, white mud, with the centre of the island N.W. ¼ W. distant 10 miles; there were 13 fathoms water at 2 cables from the edge of the reef, and 7 fathoms at a short distance from the edge. In April 1859, H.M. gun vessel *Leven* anchored three-quarters of a mile off shore in 5 fathoms, with the centre of the island bearing E. by N.

In May 1866, H.M.S. *Serpent* anchored on the sunken part of the reef, 4 miles S.S.W. of the island, when the depths were observed to be generally 3 to 4 feet shallower than was previously supposed. In the hazy weather, which generally prevails during the N.E. monsoon, the island is seldom visible beyond 5 or 6 miles, and the breakers at the edge of the reef may possibly not be seen until within one mile of them.

Caution.—When beating against, or running with, the strength of the monsoon up or down the China sea, vessels should always endeavour to pass to leeward of Pratas reef on account of the invariable set of the current to leeward; for there are no soundings to indicate a near approach, and the weather is frequently thick and hazy in this vicinity. The safest quarter to make the reef is from the north-west, the island being on its western side, and the currents in the neighbourhood invariably running in a N.E. or S.W. direction according to the monsoon. Approaching the reef a vessel should be conned from the fore-top. The sun should be well above the horizon, and if possible astern or on the beam, as the bottom can then be easily seen in 10 fathoms.*

DOUBTFUL REEFS near the PRATAS.—Captain Hossack of the ship *Cyclone* reported, "That on the 9th August 1861, when standing to the N.W., wind W.S.W., tacked ship, having seen two patches, the easternmost of which appeared to be very shoal, about 2 or 3 fathoms water, extending about 400 feet, and the water breaking on it. From good observations the position of the reef is lat. 21° 31′ N., long. 117° 7′ E."

* An extraordinary current was experienced by H.M.S. *Encounter* while on passage from Manila to Hong Kong in March 1888, for particulars of which *see* page 39.

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The ship *Dorothea* was reported to have been wrecked on a reef in lat. 21° 5′ N., long. 116° 50′ E., which position is 14 miles north of Pratas island.

Some search was made in 1866 for these doubtful dangers, never before nor since observed. H.M.S. *Serpent** passed within a mile of the reputed position of the Hossack, and obtained 175 fathoms; black and gray sand, at 2 miles N.W. of it. To the northward, soundings of 60 fathoms were taken on a bank 20 miles in extent, which bank is sufficient, when the current is deep, to cause such ripplings in fine weather, or broken water in bad, as might lead an observer to the erroneous conclusion that he had seen a shoal.

Owing to a change† in the direction of the current, the position assigned to the *Dorothea* reef was not sounded over, but 190 and 160 fathoms were obtained 5 miles N.E. and S.E. of it, respectively.

NORTH COAST OF LUZON.‡

The winds and climate of this coast and of the Bashee channel are described in Chapter I.

CAPE BOJEADOR,§ which forms the north-west extreme of Luzon, is a low point with a reef of breakers projecting off it. From hence the coast takes a north-east direction, and at the distance of 6 miles is Negra point, on the east side of which is anchorage with southerly winds. Dialao point is 9 miles N.E. by E. of Negra point, and the deep bay between has much foul ground on its eastern shore. There is anchorage at the bottom of this bay, near the small port of Bangui, 6¼ miles East of Negra point, which is said to have been long shut up by an earthquake.

Mayraira, or Cavndian or Cauagan point, the north extreme of Luzon, is 4 miles N.E. by E. of Dialao point, and has a reef projecting about a

* Commander Bullock, R.N., who made this search, remarks, "We stood out towards the Hossack, obtaining depths of 58 and 60 fathoms, fine gray sand and stones, some 10 miles beyond the 100 fathoms line of soundings, and one cast of 49 fathoms, rock (doubtful), whereabout the 150 fathoms line would be, and about 8 miles N. by E. of the position. The water then deepened to 175 fathoms at 3 miles south-eastward of the reported shoals, and 237 fathoms at 5 miles; bottom, fine gray speckled sand." Until further investigation has been made, caution is requisite when navigating in this vicinity.

† The current changed so frequently in force and direction that the reckoning, checked only by an occasional observation, had to be corrected by sighting the Pratas. The search was not continued owing to the passage of a typhoon to the southward, a rare occurrence at the beginning of May, the storm wave of which rendered the anchorage on the reef unsafe, and compelled the *Serpent* to put to sea.

‡ The west coast of Luzon is described in the China Sea Directory, vol. ii., p. 261.

§ *See* Admiralty Charts, northern portion of the island of Luzon, with the Bashee and Ballintang channels, No. 2,454; scale, $d = 6{\cdot}2$ inches; and China sea, sheet 4, No. 2,661.

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mile out. About 1½ miles southward from Mayraira poin s a small bay, open to the eastward, in which is marked 9 fathoms in the Spanish chart. Point Lacaylacay is 8½ miles E. ¾ S. of Mayraira, and between them is Baloay bay, an indentation of the coast of which nothing is known. Four miles further east is a sandy bay where the depth is 11 fathoms; its eastern point is Cabicungan, 12½ miles E. ¾ S. of Mayraira, and 3½ miles East of Cabicungan is Pata point.

The description of this part of the coast in the last edition of the China Pilot was as follows* :—"Caravallo or Patapa point, bearing about E. by S. 11 or 12 miles from Mayraira point, is a bluff steep point of white cliffs, having a mass of high mountains, the Montes Patapa, contiguous to it. To the eastward of Caravallo point there is a round hill of middling height, called Pata point. The whole of the coast from cape Bojeador to this place is steep, without any soundings until near the shore; the land is of moderate height, and in some parts rather low close to the sea, with several rivers; but the country inland is high and mountainous."

On a comparison of old and recent charts, Caravallo would appear to be identical with Lacaylacay point, and Cabicungan point is probably low.

From Pata point the coast trends south-eastward for 43 miles, and then north-eastward for 27 miles to cape Engano, the north-east extreme of Luzon, forming an immense bay. Fronting the sea is a considerable space of moderately elevated or rather low land, interspersed with villages and intersected by rivers. On the western side is the Abulug, a chain of mountains parallel to the coast and about 6 miles inland. There is a continued beach along this coast with regular soundings, generally 5 to 10 fathoms at a mile or two off on the western part, and the same depths at 3 to 6 miles off shore in the bight of the bay, deepening again near the eastern shore.

At 14 and 15½ miles S.E. by E. from Pata point are the entrances of the San Juan Pamplona and the Abulug, two small rivers, with a low island between them. A sandbank, the only known danger on the coast, and on which the sea breaks in bad weather, lies about 2 miles N. by E. of the bar of the Abulug, and fronting the point to the westward of the river. It extends E.S.E. and W.S.W. 2 miles, and about a mile outside it there are 35 and 40 fathoms, fine black sand.

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* The original description, which agrees better with the recent survey, is as follows: —"Point Caravallo is a bluff, steep point of white cliffs, bearing about E. by S. 3½ or 4 leagues from point Cavndian, having a mass of high mountains contiguous, which go by the same name. Close to the point there is an islet, and other islets lie near the shore, about 1½ or 2 miles to the eastward. About 4 leagues eastward from point Caravallo there is a round hill of middling height called Pata point, &c."—*China Pilot*, 1st edition, p. 177.

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The entrance of the Cagayai, Rio Grande de Cagayan, 14 miles south-eastward of the Abulug, has good anchorage in 10 or 11 fathoms, about 1½ miles N.N.E. from its mouth. The point on the east side is known by the church and convent of the town of Aparri built on it; abreast of which, or north from the church is the best anchorage. The river is about a third of a mile wide at entrance, with 2 and 2½ fathoms on the bar, deepening to 5 and 6 fathoms, mud, inside. The coast to the eastward of this river is flat, with soundings of 20 fathoms, black sand, about 6 miles off shore.

PALAUI ISLAND,* 5 miles in extent and moderately elevated lies contiguous to the north-western point of the large promontory which forms the north-eastern extremity of Luzon; and between Palaui and the coast is formed the port of San Vincente. The western shore of the island appears bold, but from its eastern side a reef projects 1½ miles, the edge of which is about half a mile outside and around the small islet Eschucha.

CAPE ENGANO, E. ¼ S., 54 miles from Pata point, is the north point of Palaui island. Off it are the two Hermanoz islets; and off the N.E. point, which is a mile east of the cape, are some rocks, and also at the distance of half a mile the islet Gran Laja, which is a square, steep mass of lava about half a mile in extent, which may be seen at the distance of about 27 miles.

It has been stated that a coral reef, with high breakers and several rocks above water, extends E.N.E. about 3 miles from the point of the cape, and that patches of shoal water project a mile beyond it; but the recent Spanish survey does not corroborate this, but shows deep water about Gran Laja and the adjacent islets. Nor does the Spanish chart show any extensive reefs off Escarpada point, the north-east point of Luzon, which has by some been considered to be the true cape Engano, the name of which signifies "deceit."

PORT SAN VINCENTE,† 30 miles E. by N. ¾ N. of Aparri, is formed by a small island of the same name lying between the north-east end of Luzon and its adjacent island of Palaui. There is room in this port for three or four ships, sheltered from all winds; but the entrance is narrow and intricate, being formed between shoals on either side, which project from the south-east part of Palaui, and from Vincente island; a vessel is therefore obliged to warp in.

There is good anchorage in 5 fathoms opposite the mouth of the port on the south-west, sheltered from all winds but those between W. and S.W.

* Usually called Palibi island. Point Patapat or Caraballo of some charts.

† *See* Plan of port San Vincente, scale, m = 0·6 inch, on Admiralty Chart, No. 2,454.

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There is also anchorage along the coast between Aparri road and this place, in 15 or 20 fathoms water within 2 miles of the shore; the soundings are pretty regular, excepting at a depression in the bank about 10 miles to the S.W. of Vincente, where the depths are 70 and 80 fathoms water about 2½ miles off shore, having close to the edge of it 30 fathoms, black sand.

There is no description of the eastern entrance to this port, but the survey shows a channel of 5 fathoms between the reefs off the Luzon shore and Roua islet, in the centre of the narrows. The approach is from the eastward, and is a mile wide between the reefs around Escucha islet and those bordering the main.

N.E. COAST of LUZON.—From San Vincente the coast runs East 5 miles to Escarpada point, before mentioned, which has been usually distinguished, both in charts and sailing directories, as cape Engano. Here the coast turns abruptly to the south-eastward for 12 miles to Yligan point, where the Spanish survey terminates, and where the coast again abruptly turns to the south-westward.

Little is known of the north-east coast of Luzon. Southward of Cape Engano, at the distances of 11, 16, and 22 miles, are three mountains, the respective heights of which are 2,086, 3,451, and 3,995 feet, which must be fine landmarks in clear weather. Beaten incessantly* by the whole fetch of the Pacific surf, at best it must be an iron-bound coast, and is so indicated, and probably with very strong currents drifting past it. This must be especially the case in the N.E. monsoon, which brings the rainy season here; and when the remark before made is remembered, that the mountain ranges intercepting the S.W. monsoon, bring the rain on the opposite coast, although in a less continuous manner, it will be inferred that they reach the eastern shore very much mitigated in their force, and are probably felt as light and baffling winds, or as more violent squalls. In the absence of any recorded experience it may be the safest course to entirely avoid it as far as possible.

Reported shoal.—According to the statement of Mr. Denier, master of the French bark *Douquay Tronin*, a shoal was passed on the 28th of May 1875, N.E. of Luzon island. When sighted it was awash. It extended in a S.W. and N.E. direction, thence running N.W. for about 100 yards. The vessel passed within a distance of 2 miles, going 6 knots an hour. Mr. Denier places the shoal in latitude 19° 5′ N. and longitude 124° 43′ E.

* Findlay's Sailing Directory for the Indian Archipelago, &c.

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DIRECTIONS.—The channel between capo Engano and Camiguin island to the N.N.W. is 20 miles wide, and clear of danger. As the currents set strongly to the northward in the S.W. monsoon, it will be prudent for vessels proceeding to the eastward from this coast with light winds to keep on the south side of the channel, to prevent their being drifted to the northward near the Guinapac and Didicas rocks which lie north-eastward of Camiguin.

BABUYAN ISLANDS.

The Babuyan or Five islands, named Camiguin, Fuga, Dalupiri, Calayan, and Babuyan Claro, form a kind of circular chain fronting the north coast of Luzon. The channels between them are said to be safe, without soundings, and their coasts are generally steep-to; but as these islands have not yet been examined their shores should be approached with caution.* For winds and weather, *see* page 5.

CAMIGUIN ISLAND, the south-eastern of the group, about 10 miles in extent N.N.E and S.S.W., is high and hilly, and lies 20 miles north-west of cape Engano. Its shore in some places is bordered with coral rocks, having soundings of 30 to 35 fathoms about a mile off; and the land is low close to the sea along its eastern and northern sides. The southern part of the island is formed of a high mountain, formerly a volcano, visible at a distance of 60 miles. To the westward of this mountain some steep white cliffs front the sea, about 2 miles to the southward of the south point of Port San Pio Quinto.

Port San Pio Quinto† may be considered the only place amongst these islands tolerably safe for a large ship, for the bottom in it is not so rocky as in Musa bay, Fuga island. The port is formed by a concavity in the land about 3 miles wide and 1½ miles deep, a little southward of the middle of the west side of Camiguin, and is sheltered from the westward by Pio Quinto islet, which lies in the middle of the entrance. This islet is high, about 1½ miles in circumference, steep to seaward, and has on each side a safe channel leading to the port. The south channel, 1½ miles wide with 40 fathoms at entrance decreasing gradually inside, is between the islet and the south point of the port, which, with an islet near it, has the colour of iron; and a little to the southward there is a boiling spring of salt water. The north channel, between Pio Quinto islet and north point of the port, is about a mile wide, with soundings fronting it of 28 and 30 fathoms, and 17 and 18 fathoms inside; but there is a rocky patch of only 6 and 8 fathoms, lying rather nearer the islet than mid-

* *See* Admiralty Chart of the northern portion of Luzon with the Bashee and Ballintang channels, No. 2,454; scale, $d = 6 \cdot 2$ inches.

† *See* plan of port San Pio Quinto; scale, $m = 1$ inch, on the above Chart, No. 2,454.

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channel, and a coral reef projects about a quarter of a mile from the north point of entrance.

The bottom in the channels and in the port is mostly soft sand, with a little coral in some places, and the soundings decrease gradually to the shore around. The best anchorage is in 15 or 16 fathoms to the eastward of Pio Quinto islet, abreast a rivulet of fresh water, which bears E.N.E. from the islet.

Tides.—It is high water, full and change, in port San Pio Quinto at 6 h. 0 m., springs rise about 6 feet.

GUINAPAC ROCKS, bearing E. by S. about 10 miles from the north point of Camiguin, consists of two rocks like towers, one larger than the other, with some smaller rocks contiguous. There are no soundings within a short distance of their eastern side; between them and the nearest part of Camiguin is a channel 6 miles wide, which is safe on the island side.

DIDICAS ROCKS, or Northern Pillars, about 7 or 8 miles N.E. ½ E. of the Guinapac, are a group of four sharp-pointed rocks, much higher than the latter, and when seen at a considerable distance appear like ships under sail. They are about 2 miles in extent N.E. and S.W., and among them are many rocks of various sizes, which render their approach dangerous in light winds; for the currents run strong to the northward, producing ripplings like breakers in the vicinity of and among these dangers, and there are no soundings near them where a vessel could anchor in case of necessity.

FUGA ISLAND, 18 miles west of Camiguan, is lower, and of an even appearance, terminating in low land at the eastern part. It is about 10 miles long, east and west, and there are irregular soundings along its south-west side, where a vessel may occasionally anchor.

Musa Bay is formed between the west end of Fuga and the two small adjacent islands, Barrete and Mabag. The best channel into the bay is from the southward, between Barrete and the west point of Fuga, the depths being 14 and 16 fathoms outside, and 9 to 12 fathoms in mid-channel. The west channel into the bay between the two islands is narrow, with soundings of 6 to 10 fathoms. The north channel into the bay is rendered intricate by a reef extending half way across from the north-east point of Mabag towards Fuga, and the tail of this reef, joining the north-west point of Fuga, is a bed of rocks with 5 and 6 fathoms water on it; this channel, therefore, ought not to be attempted unless in a case of necessity, and a vessel to enter by it must borrow pretty close to Fuga. Barrete island has a reef lying off its west side, and another projecting

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from its south point. Water may be procured, but with difficulty, some distance inland.*

DIRECTIONS.—Musa bay, although sheltered from the sea, is only fit to run for in case of necessity, the bottom everywhere being coral rock mixed in some places with a little coarse sand or gravel. The depths are 17 to 12 fathoms in the middle, shoaling to 4 or 5 fathoms near the coral reefs that line the shores on either side, and the breadth of the bay is not more than three-quarters of a mile. The best anchorage is near the north-east side of Barrete island, in 14 or 15 fathoms water where the bottom s rotten coral and coarse sand ; near Fuga it is all very rocky.

TIDES.—The tide rises in Musa bay about 5 or 6 feet, but it is irregular in time and direction.

DALUPIRI ISLAND, about 7 miles North of the west end of Fuga, is the westernmost of the group; it has a level appearance, extends 9 miles in a North and South direction, and may be seen from a distance of 30 miles. About 1½ miles off its south point is Rijutan islet, with shoals extending a considerable distance to the southward ; but the water is deep† in the narrow channel between this islet and the south end of Dalupiri.

CALAYAN ISLAND, lying about 13 miles north-east of Dalupiri, is formed of mountainous and uneven land, highest in the centre, with low gaps in some places ; it is steep-to, without any safe anchorage, and may be seen in clear weather at a distance of 45 miles. Some rocks above water extend about a mile from its south point; and about 1½ miles off the north-east point is Panuctan isle, about a mile in extent north and south.

H.M.S. *Cornwallis* experienced a high topping sea (first reported as breakers) in passing between Dalupiri and Calayan; this was almost immediately succeeded by a glassy smoothness. These effects were attributed to a strong north-west current.

WYLLIE ROCKS, consisting of two clusters above water with high breakers between, are dangerous to vessels passing through the Babuyan group at night. The southernmost rock, which is the largest, bears N.N.E. distant about 5 miles from Panuctan islet ; the other cluster lies about 1½ miles in a N.N.E. direction from the largest rock. The chart shows sunken rocks between Panuctan and Wyllie rocks.

BABUYAN CLARO, the northern and highest of the Babuyan islands, is about 25 miles E.N.E. from Calayan. On its west end is a

* *See* Plan of Musa bay, No. 2,454; scale, $m = 0{\cdot}9$ inch, on Admiralty Chart, No. 2,454.

† The Spanish map of the islas Filipinas for 1852, shows a reef extending across from Rijutan islet to the south end of Dalupiri.

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volcano, between which and the mountains on the eastern part is a concave curve in the form of a crescent, when viewed from the north or south; but when the island is seen at a great distance from the eastward, it appears as one round mountain with a detached hummock to the northward. A reef projects from the west point of the island. The south point is steep and rocky, and about a mile off it is a black rocky islet in the form of a sugar loaf.

The BALINTANG CHANNEL is 43 miles wide between Babuyan Claro and Sabtan, the southernmost of the Batan islands, and being reputed free of all danger, is frequently used by vessels when proceeding by the Eastern passages to China.

BALINTANG ISLANDS,* in lat. 19° 58′ N., long. 122° 14′ E., are an isolated group, consisting of three small but high-peaked islets or rocks, visible about 27 miles off in clear weather, and when in one bear E. by S. and W. by N. They lie in the eastern part of the Ballintang channel, equidistant, about 27 miles from the Babuyan and Batan groups. The westernmost islet is much larger than the others, and a hole is seen through it when bearing N.E.; they are steep-to, and may be passed on either side at 2 or 3 miles distance, but the sea beats violently against them in bad weather.

BATAN OR BASHEE ISLANDS.

The Batan or Bashee islands, so called by Dampier from the name of an intoxicating liquor much used by the natives, lie northward of the Babuyan group, and consist of a chain of islands, mostly high, extending from lat. 19° 58′ to 21° 13′ N., and the channels among them are thought to be safe and free from hidden danger.† They consist of three large and several smaller islands extending over nearly a degree of latitude. The southern group, Batan, Sabtan, Ibugos, and Dequez, were surveyed by Captain Sir E. Belcher, H.M.S. *Samarang*, in 1843–1844. During the N.E. monsoon strong winds prevail amongst these islands, and the currents are occasionally very strong; the flood sets to the S.W., the ebb to the N.E.

Supplies.—The islands of Batan and Sabtan are mountainous, with many broad cultivated spots; the highest peak, apparently an old volcano, is about 5,000 feet above the level of the sea, and thickly covered with trees. The former is, however, richer in soil, and produces abundance of

* Captain W. Symington, of the screw steamer *Hankow*, places these islands in longitude 122° 7′ 30″ East.

† *See* Admiralty Chart of Batan islands, No. 2,408; scale, $d = 24$ inches, with Plans of anchorages.

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yams, sweet potatoes, maize, onions, garlic, rice, grain, &c.; indeed the only want appears to be variety of seed. Cattle, pigs, poultry, sheep, and goats are abundant; deer are found on Sabtan and Ibugos, as well as quail on all the islands. Wood is reasonable and plentiful, as well as water; but this latter necessary is difficult to procure, as the rivers are barred by reefs, which prevent boats from approaching or rafting off sufficient quantities for vessels of war; this, however, would soon be remedied if the visits of vessels rendered it advantageous.

BATAN ISLAND is about 9 miles long, N.N.E. and S.S.W., and Mount Irada, on its northern extremity, is 3,806 feet above the sea. The rest of the island is mountainous, and has several broad and cultivated spots. There is a high rock about ½ a mile N.E. of the island.*

Anchorage.—The *Samarang* anchored in the bay† of San Domingo at the northern part of the west side of Batan island, on a fair clear bottom of fine coral sand, the best berth being with the convent barely open, when moored off the northern point of the bay in 13 fathoms; this, however, is not very secure with a northerly wind. Although the holding ground is good, this bay can only be resorted to in the N.E. monsoon. There is a patch of rocks, which show at low water, lying N.N.E. 4 cables from Chaguie point, the south point of the bay, having 27 fathoms close-to on the west, and 4½ fathoms on the east side; and at a cable's length E.N.E. from the point is a rock awash at low water.

The authorities recommended the anchorage off San Carlos, about 2 miles to the south-west, as the best for obtaining a supply of water; but this position is exposed, and watering could only be effected in fine weather. The passage through the reef is, however, quite safe for the largest boats, which land on a sandy beach. This passage has been cut to admit schooners of 50 tons, which are generally hauled up when they arrive from Manila with the first of the S.W. monsoon.

The next anchorage‡ is that of San Vicente, which is the port of Ivana, or landing place for that village; it, however, ought not to be resorted to, as it is very confined, with sandy bottom close to the reefs, and must be quitted the moment a northerly wind threatens. Several vessels have been driven off, and being unable to purchase their anchors have had to cut or slip, owing to the length of cable out. During the S.W. monsoon other shelter must be looked for, and probably will be found under the north-east part of the island of Sabtan; but it has not yet been sounded. On the eastern side of Batan are two large bays which appear

* Rear Admiral Duburguois, commanding French squadron in China.

† *See* Plan of Santo Domingo; scale, $m=2$ inches, on Admiralty Chart, No. 2,408.

‡ *See* Plan of Ivana on same Chart.

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to afford shelter; the northern and best is named Sonson, the other Mañañion; but both contain many rocks, and have not yet been sounded.

SABTAN ISLAND is separated from the south-west end of Batan, by a channel 2 miles wide, which appears clear of danger. Off the north end of Sabtan are two ledges of rock, with a passage between them carrying 14 and 10 fathoms water. These rocks are fixed on the chart by land stations, from which they were clearly visible by the edges of their breakers; according to the accounts given by H.M.S. *Alceste* they have only three feet water on them at springs.

IBUGOS or BASHI ISLAND is small and rather low, excepting a hill on its south end, where there is a village. It is separated from the west side of Sabtan by a channel about a mile wide, which affords indifferent anchorage,* the bottom being rocky with sandy patches between. There are no facilities for watering, the stream from the rivulet inside the south-west point of Sabtan entering at the coral beach at least half a cable from the spot where boats could float. This is the only safe landing place, the shores on both sides of the channel being bordered by a reef, through some of the gaps in which the native boats can pass in fine weather. Dequez or Goat island, also small and rather low, lies nearly half a mile westward of the north-west point of Ibugos.

DIRECTIONS.—As the current sets strong to the southward between the above islands in the N.E. monsoon, it is advisable to work westerly round Dequez, and not to cross the channel between Batan and Sabtan until the dividing neck of San Carlos is clearly open, E.S.E., as the stream dividing at Mabatui point, sends one current southerly; the other, which is an eddy, is favourable from thence north-easterly to San Domingo.

If bound to this latter anchorage, work up to the north-west angle of the island until the wind is free to run down, when round-to with all aback, and drop the inner anchor in 12 fathoms; then veer and drop the outer anchor in 25 fathoms, which will afford sufficient room to weigh. When moored the vessel will be in 15 fathoms, and the current will keep a fair strain on both cables.

IBAYAT ISLAND, about 8 miles long, N.N.E. and S.S.W., lies 14 miles N.N.W. of Batan, and the channel between is free from danger; Mount Santa Rosa at its north end rises 680 feet, and Mount Riposet at its south-eastern part, 800 feet above the sea. The exterior of the island as viewed from the sea presents a blank barren outline, defying disembarkation to any but those acquainted with the locality, and

* *See* Plan of strait between Ibugos and Sabtan, on Chart, No. 2,408.

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is moreover without anchorage; the interior is, however, highly cultivated, in many spots exhibiting patches of good timber trees; abundance of refreshment can be easily obtained.

DIOGO or HIGH ISLAND, is a small island, 848 feet above the sea, lying 3½ miles eastward of Ibayat, and the channel between is clear of danger. This island is steep-to on its western side, but several small islets lie off its eastern side, the outermost being distant a short half mile.

MABUDIS and SIAYAN ISLANDS.—Mabudis island, lying N.N.E. 6 miles from the north end of Ibayat, is about 1½ miles long in a N.E. and S.W. direction, high and steep-to. One mile S.S.W. of it is Siayan island, about 1½ miles in circumference, having off its north-east side several detached rocks. The channel between Mabudis and Siayan is rendered unsafe by detached rocks; that between Siayan and Ibayat is about 4 miles wide, and free from danger.

Y'AMI and NORTH ISLANDS.—Y'Ami, the northern island of the Bashee group, is about a mile in circumference and tolerably high; the position of the islet lying off its south-west point (by Belcher) is lat. 21° 4′ 56″ N., long 121° 58′ 24″ E.

North island, lying 2 miles S.S.W. from Y'Ami, is high and steep-to, except on its eastern side, off which, at a cable, are three islets and some detached rocks. The channel between Y'Ami and North island is safe and carries soundings with rocky bottom, but too deep for anchorage; that between North island and Mabudis is 9 miles wide, and free from danger.

The North Bashee rocks could not be found by Captain Sir E. Belcher, who states "they have no existence* in the position assigned them in the charts, nor in the visual radius from the mast head of the *Samarang*, 108 feet above the level of the sea."

The BASHEE CHANNEL, also frequented by vessels making the Eastern passage to China, is 80 miles wide between the Batanes and Formosa, but its navigable breadth is greatly contracted by the dangerous Gadd rock, which must be remembered when sea room is needed to avoid the track of a typhoon. For winds and weather, *see* page 6.

GADD ROCK, or Cumbrian Reef.—The position of this dangerous rock, in the fairway of the Bashee channel, is now† ascertained to be in

* It seems probable, as has been found to be the case in many other similar instances, that Y'Ami and North islands have in fact been sighted and their positions erroneously estimated.

† Re-examined by Commander E. W. Brooker, R.N., in 1867. Lieutenant Ross, I.N., made the latitude 21° 43′ N.

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lat. 21° 42½′ N., long. 121° 39′ E., Little Botel Tobago bearing from it N. ¼ W. 14½ miles. It is about ½ a cable long; a depth of 10 feet was obtained about the middle of the rocks, with depths of 30 and 40 fathoms immediately around, and 69 and 127 within a distance of 1 mile; while between it and the Botel Tobago islands depths of 177 to 69 were obtained.

The Gadd Rock may be considered one of the worst hidden dangers known. At low water the sea would probably break, but the locality is generally covered by violent tide ripples and smooth whirls, which extend more or less the whole distance to the Vele-Rete rock, although these indications of its positions are not always visible on approach. The neighbourhood of this danger should therefore be avoided.

Reported Shoal.*—A shoal spot (supposed to be a coral bank) has recently been reported by the English steamer *Mark Lane* as existing in lat. 21° N. long. 120° E. (approximate).

DIRECTIONS.—Quitting the Batan islands during the N.E. monsoon, or merely working up to the northward past them, it is advisable to make short boards to the north-east on the western side of Batan island, until Mount Irada bears S.S.E., then make a stretch to the north-west and work up on the western sides of Ibayat, Siayan, and Mabudis; but on reaching the latter, pass through easterly between it and North island where the current will favour northerly.

Keep well to the eastward, or endeavour to pass well to windward of Botel-tobago sima, as the currents in that neighbourhood press strong to the westward, and the changes from strong breezes to calm, attended with swell, are troublesome, as well as harassing.

Gadd rock lies in the fair way of the Bashee channel, and to keep clear of it vessels should keep either towards Botel-tobago or towards the northern part of the Batan group, taking great care to avoid the mid-channel track. When passing southward of the above danger in thick weather or in the night, keep well towards the latter group, making allowance for a northerly current, which is generally experienced in light winds and during the S.W. monsoon. In thick weather from lat. 21° 15′ to 21° 21′ N. is a good track to preserve when passing between the Batan group and Gadd rock. Several vessels during light winds have been drifted by the current between Formosa and Botel-tobago.

BOTEL-TOBAGO SIMA† is high, 7½ miles long, N.W. and S.E., appears in form of a saddle, or with a gap in it when viewed from a S.S.W. or N.N.E. direction, and is visible about 50 miles from the mast-

* U.S. Notice to Mariners No. 49 of 1884.

† *See* Admiralty Charts :—Formosa island, No. 1,968; scale, $d=6$ inches; also Bashee and Ballintang channels, No. 1,352; and Hong Kong to Liautung, No. 1,262.

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head. The island is well inhabited, and its highest part is crowned with trees; the north-east peak is 1,850, and the west peak 1,820 feet above the sea.

There are several large villages on the southern part of the island, and on the north-west side are several rocky points. On the western side is a small conical islet, about 30 feet high, lying fully half a mile from the shore. Detached rocks, remarkable for their spire-like form, and also a large islet rock off the north-east end, lie off the north extreme.

Indifferent anchorage was found about half a mile from the beach on the north side of the island, in 21 fathoms, black sand and rock. A singular shaped needle rock, having an arch through it, was selected for the observation spot,* and found to be in latitude 22° 5′ 21″ north, longitude (assumed) 121° 31′ 5″ E., which places the island very nearly four miles farther west than the position hitherto assigned it. The coast is rocky in almost every part, and probably dangerous to land upon, as these needle rocks are seen in many parts of the island; with the exception, however, of those off the north extreme, they are attached to the island by low land; but the ground under water often assumes the character of that which is above, in which case a vigilant look-out for rocks would be necessary when rowing along the coast. When circumnavigating the island deep water was found at a mile off shore.

At the time of the *Sylvia's* visit, the island appeared to be densely inhabited, but the natives were timid and frightened, and refused any intercourse. Goats, pigs, and fowls seemed to be plentiful, and extensive cultivation of rice, maize, and Indian corn seen. The natives of Botel Tobago do not appear to be a seafaring people, as only very small canoes were seen.

LITTLE BOTEL TOBAGO is a small island of considerable height, lying about S.S.E. 3½ miles from the southern part of Botel Tobago, and has from its north and south ends, reefs extending for three cables, on which small detached rocks are seen above water: foul ground appears to extend all around this island.

Forest Belle rock.—This rock, on which the American barque of that name struck, lies S. 10° W., distant 6½ miles from Little Botel Tobago island. Position, lat. 21° 51′ N., long. 121° 34½′ E.

The Alceste shoal, formerly marked on the chart in about lat. 22° 5′ N., long. 121° 18′ E., is supposed to have no existence.

VELE-RETE ROCKS, in lat. 21° 45′ N., long. 120° 49½′ E., lie 9 miles S. by W. from South Cape, and on nearly the same parallel, and about 47 miles westward of Gadd rock in the Bashee channel.

* By Commander E. W. Brooker, R.N., H.M. surveying vessel *Sylvia*, 1867.

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They are a mass of detached rocks, about a mile in extent, above, level with, and below the surface of the sea. The highest, which is S. by W. 9 miles from the South cape of Formosa, and 12 miles S.S.E. $\frac{1}{3}$ E. from South-west point, may be seen from a distance of 5 miles, and with two others are from 15 to 25 feet above the sea, lying in a N.W. and S.E. direction, and very narrow. The depths about them are from 50 to 70 fathoms, except on the south-east side, where at half a mile the depth is 24 fathoms.

The channel between them and the south end of Formosa is safe; but very heavy tide ripples are often experienced, extending nearly the whole distance across to them from the South cape; (and also in the neighbouring channels), and they have been observed to run so high that they resembled the sea breaking furiously over a dangerous shoal.

The northern current, described on page 21, sets with great strength over these rocks to the north-eastward, passing the South cape of Formosa, and the islands of Botel Tobago and Samasana, causing strong eddies round the points and bays of the islands, and necessitating great caution when nearing them. *See* Japan stream, pages 21, 23.

FORMOSA ISLAND.

EAST COAST; SOUTH CAPE TO PETOU POINT.

FORMOSA ISLAND, 210 miles in length and 80 miles wide at its broadest part, is high and mountainous throughout its whole extent, except at the central part of the west coast, where a broad alluvial plain stretches from the mountains to the sea, and on which is situate the Chinese capital of Tai-wan fu.*

The Chinese have long been in possession of the plain and the harbours and villages of the west and north coasts, but the east coast is still peopled by aboriginal and warlike tribes, not subject to the Chinese, yet who hold intercourse with them of a more or less friendly character.

Treaty with the Natives of Formosa. — In consequence of repeated acts of outrage and murder towards the shipwrecked crews of foreign vessels, in revenge for former injuries, a treaty was concluded on 15th October 1867, with the hostile tribes of the south part of Formosa, by the United States Consul† of Amoy, by which the

* *See* Admiralty Charts :—Formosa island and strait, No. 1,968, scale, $d = 6 \cdot 5$ inches; also, China General, from Hong Kong to Liautung, No. 1,262, scale, $d = 2$ inches. For winds and weather *see* page 7.

† General Le Gendre. The immediate cause of the negotiations was the massacre of the crew of the American vessel *Rover*.

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southern end of Formosa has been rendered safe to those who may be driven on its coasts by distress. The treaty was arranged with Tok-e-tok, principal chief of the tribes of the south, who engaged to abstain from molesting strangers in future, to supply them if in want, and receive them in a friendly manner if they landed to procure water or other necessaries; and it was further agreed, that a red flag should be hoisted by vessels to announce their intention of landing peaceably. As an additional security, it was arranged that a fort should be erected on the heights of Tossapon,* as a menace to the aborigines and a centre of refuge to shipwrecked mariners. The Chinese of the neighbourhood, themselves almost savages, also signed a formal agreement, that if, contrary to promise, any stranger fell a victim to or were badly treated by the aborigines, they would themselves seek out the guilty parties in order to deliver them into the hands of the authorities; their persons and goods being considered a security for the due execution of this condition.

SOUTH CAPE or NAN-SHA, in lat. 21° 55′ N., long. 120° 50′ E., is low, and, together with the one which is three-quarters of a mile E.N.E. of it, formed of coral limestone. An isolated rock with deep water around stands up boldly, close to the extreme S.E. point; these rocky points are much perforated by the action of the sea. The cape or point is fringed by coral.

Over the bay 4 miles to the north-west, is a peculiarly rugged hill, 1,035 feet high, from which the land slopes down gradually to the cape, the whole, with the exception of a few clearings, being densely wooded. Farther northward is a high double peaked mountain, visible 60 miles in clear weather. The south bay is described on page 272.

Caution. — It was at this point and the neighbourhood that the attack was made on the *Dove's* boat when surveying in 1866; where the captain and crew of the ship *Rover* were recently murdered; savage attacks made on the boats of H.M.S. *Cormorant*; and also on the *Sylvia's* surveying party in 1867, indicating that the natives of the south end of Formosa have been always until lately hostile to strangers; and their traditional propensity for the collection of skulls is so well authenticated that little or no hope of life could have attended the misfortune of shipwreck, which, from the large quantities of drift and wrecked wood to be seen on the shore, seems to have been frequent.

To the north-eastward of the cape there is said to be a village and harbour for small craft.

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* Tossapon hill is on the south-western promontory. The fort is situated over Black and S.W. points (pp. 272, 273), and is therefore plainly visible from the sea.

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Light.—A *fixed* light (South cape light), showing *white* between the bearings of S. 85° E. through north and S. 55° W., and *red* from S. 85° E. to S. 28° E. is exhibited on South cape or Nan-Sha, the southern extremity of Formosa; it is elevated 180 feet above the sea, and should be visible in clear weather from a distance of 20 miles.

The illuminating apparatus is dioptric, or by lenses, of the first order.

Between the bearings of S. 55° W. and S. 86½° W., the visibility of the light will depend on the distance from it, owing to the height of the land eastward of the lighthouse. With the light bearing S. 55° W., a vessel must be between 15 and 20 miles distant to see it; but as it is brought to bear more to the westward, the arc of visibility is increased, until, on the bearing S. 86½° W., it is visible at all distances to the extreme limit of its range.

To the westward and north-westward of south-west point, the light is entirely obscured by the land between the bearings of S. 80¼° E. and S. 28° E.

The lighthouse, 71 feet high, of iron, and circular in shape, is situated about 550 yards due north from high-water mark at the southern extremity of the cape.

The tower, dwellings, and boundary wall, are painted white.

Position, lat. 21° 55′ 00″ N., long. 120° 50′ 40″ E.

Fog Signals.—During thick or foggy weather, should a bell, fog horn, steam whistle, or other sound be heard, indicating the proximity of a vessel, *two* guns will be fired with an interval of *three minutes* between them; and if the vessel' fog signal is still heard, the firing will be repeated after an interval of *eight minutes*.

EAST COAST of FORMOSA,* extending 200 miles to the N.N.E., is mountainous, and with the exception of Sau-o bay is without harbours, and deep water will be found close in to the land. The mountains rise almost immediately from the sea; their sides in some places are cultivated, and scattered houses are seen.

This coast is not visited by the full strength of the N.E. monsoon, which probably results from the mountainous character of the country preventing the breeze blowing home. Sailing vessels, however, experiencing strong gales at 20 miles to the eastward, might feel cautious in venturing in-shore. Nor is there any necessity to run to leeward; but, if, when beating up, they should experience the breeze declining in strength, with less sea on the western board, particularly between 9h. a.m.

* From the remarks of Mr. William Blakeney, R.N., Assistant Surveyor, made during the visit of H.M.S. *Inflexible* to Formosa in search of missing Europeans, June 1858; also those of the late Commander E. W. Brooker, R.N., H.M.S. *Sylvia*, 1867.

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and 3h. p.m., or up to sunset, they will find it advantageous to hug the coast within a moderate distance; but good judgment and caution are requisite, as sudden loss of wind attended by inconvenient swell might be attended, if followed by calm, with imminent danger.

DOUBLE PEAK, a mountain on the coast 58 miles to the northward is about 2,500 feet high. When H.M.S. *Inflexible* was exploring this coast, soundings were tried for at 1½ miles S.S.E. of the point, with no bottom in 100 fathoms. The vessel was then within the line of discoloured water from the stream which debouches here. A junk was observed under sail close to the shore, and others either hauled up on the beach or within the entrance of the stream.

SAMASANA ISLAND, 15½ miles from the coast abreast Double Peak, is in latitude 22° 39′ 26″ N., longitude (assumed) 121° 28′ 48″ E., and lies N. ¾ W. 34 miles from Botel Tobago; its north extreme is a long low point with a double hillock on it, and a pinnacle rock, with a high arch through; a small rock lies a quarter of a mile farther out to the northward. An isolated rock lies N.E. half a mile from the east point of the island; and from the same point a reef, on which the sea breaks, extends E.S.E. 2½ miles. The south point falls abruptly.

H.M.S. *Sylvia*, in 1867, anchored in the North bay in 13 fathoms nearly half a mile from the shore on a rocky and sand bottom; as the current going to the northward sets in a strong eddy round this bay and also round the island, the anchorage is not recommended.

The inhabitants, who are Chinese, and mostly from the Amoy province say that no European vessel had called at the island since 1840. It was visited by Capt. Belcher in H.M.S. *Samarang*, June 1845, and had a population of about 150 persons (now considerably increased), inhabiting a village concealed within a bamboo hedge skirting the sea.

The cultivated products of the island are rice, maize, cucumbers, and customary Chinese vegetables and fruits; and from the eagerness shown by the people to barter yams, sweet potatoes, fowls, and eggs, for calico stuffs, they appear to be greatly in need of that article. The communication with China must be very rare.

It is advisable to avoid the lee side of the island, as calms, eddies, and variable winds are likely to cause delay.

BLACK ROCK BAY, in latitude 23° 6′ 30″ North, and longitude (assumed) 121° 26′ East, and 22 miles northward of Double peak, might afford shelter from south-west and southerly gales, but the bottom is rocky and uneven, and a heavy swell would always roll round the point. The Black rocks are two masses of coral limestone, 120 feet high, nearly touching each other, and having a little verdure on their summits. The

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island of which they are a part is barely joined to the mainland by a number of detached rocks and reefs. The *Sylvia* anchored in 13 fathoms, with the rocks bearing E.S.E., distant three-quarters of a mile.

H.M. brig *Plover* anchored in this bay and rode out a S.W. gale, the vessel swinging from 13 to 22 fathoms; the anchorage by no means is to be recommended.

With the centre of the Black rocks bearing S.W. by S., 2 miles, the depth was 29 fathoms, black sand, and the next cast to seaward, no bottom with 70 fathoms.

The COAST north of Black rock bay is rugged and rocky. The lower slopes of the hills are covered with grass; behind the hills the mountains attain an elevation of 5,000 and 6,000 feet, and are clothed with dense forest.

CHOCK-E-DAY, 60 miles northward of Black rock bay, is in lat. 24° 6½′ N. The inhabitants of Chock-e-day village were communicated with, but the high surf prevented landing. The aborigines were nearly naked, and used threatening gestures, brandishing their long knives and spears. The few Chinese among them appeared much afraid that the natives would be injured, in which case they said their lives would be taken in revenge. The river marked on the chart in this latitude was not seen. At a mile off shore there was no bottom with 115 fathoms of line.

The COAST from Chock-e-day to Dome point, 20 miles to the northward, is the boldest and most precipitous than can be conceived, the mountains rising 7,000 feet almost perpendicularly from the water's edge. No soundings with 70 fathoms at from 1 to 1½ miles off shore. Dome point, 650 feet high, is 3 miles south of Sau-o bay.

BOUDRUET ROCKS, reported to be about 65 feet high, and in lat. 24° 10′ N., long. 122° 34′ E., would be 48 miles from the nearest point of Formosa.

REPORTED DANGERS.—A shoal which would lie in lat. 24° 17′ N., long. 122° 48′ E. is reported in the *Nautical Magazine* for 1844, p. 244, as follows: "On the evening of the 16th November, with Kumi island bearing E. by S. 3 leagues, saw heavy breakers ahead and on the lee bow, apparently on a dangerous shoal, extending E. by S. and W. by N., and bearing from Kumi, S.W. by W. 3½ leagues. Having dark cloudy weather with rain, and a heavy sea running, it was too late to send a boat to sound; but the breakers were seen continually from 4.30 p.m. until 6 p.m."

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Another shoal, which would lie in lat. 24° 30′ N., long. 122° 49′ E., is mentioned in *Horsburg's* East India Directory, vol. ii., seventh edition, p. 605, thus: "A dangerous shoal, 3 miles in extent, E. by N. and W. by S., is reported as lying N.W. by W., distant about 10 miles from Kumi;" in a former edition of the same work, page 528, the distance is stated to be 3 or 3½ leagues.

Respecting these dangers, Navigating-Lieutenant John F. Barns, R.N., writes*:—"When about 30 miles E.N.E. of Sawo bay, a tide ripple was seen extending to the eastward as far as the eye could reach. It was first taken for a line of breakers which it much resembled, and I think there is much probability that the breakers reported in this vicinity have a similar origin, for when passing within three miles of the position assigned to those which are said to lie N.W. by W. 10 miles from Kumi, no indication of a shoal was seen, although there was a very heavy swell on from S.E. at the time, and the weather was clear."

KUMI, the western island of the Meiaco sima group is described on page 305.

SAU-O BAY,† commonly called Su-ao, in lat 24° 38′ N., long., 121° 50′ E., will be found an excellent place of shelter for vessels working up this coast against the N.E. monsoon. The bay is about three-quarters of a mile wide at entrance, and a mile deep, and in it are two smaller bays; that in the southern corner is a sheltered nook called Lam-hong-ho,‡ which has shallow water, and is only available for vessels of light draft (9 feet and under) of which two or three might lie moored, secure from all winds; the other, in the N.E. corner is named Pak-hong-ho, and could afford shelter to one or two vessels in 5 fathoms from all winds, except those from South to S.E., which seldom blow, excepting from June to September, when south-east winds prevail.

Sau-o or Arlyi Rocks, lie off the entrance of Sau-o bay about a mile from the northern promontory. The westernmost and largest rock, 98 feet high, lies N.E. 1½ miles from the south point of Sau-o bay, and E. by S. 7 cables from the north point; from it two other rocks bear E.N.E., 2½ cables; and S.W. by W. of it, 2 cables, is a 15 feet patch.

To the north-west of the Arlyi Rocks, and extending half a mile eastward from the north point of the promontory, is much foul ground, with rocks awash, generally breaking. Between the Arlyi and this foul ground

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* Jan. 1865.

† *See* Plan of Sau-o bay, scale, $m=4$ inches, on Admiralty Chart of harbours in Formosa, No. 2,376.

‡ Sau-o and the villages to the northward are Chinese, but Lam-hong-ho is inhabited by Pepos, a semi-civilized aboriginal tribe.

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is a channel, 3 cables broad of 7 to 12 fathoms, but the nature of the bottom which is rocky and uneven renders this channel dangerous. The southern face of the promontory is bold and its outlying rocks may be passed at a cable.

Breakwater Reef, (or Tong-sim-tai) is a reef of coral rocks about 2 cables in extent, N.E. and S.W., lying a little more than half a mile from the shore and nearly in the centre of the bay; parts of it are uncovered and others awash. At the north-east end of the reef are two conical rocks, the highest being 31 feet above the sea. This reef breaks the sea and swell, and affords the only safe anchorage in the bay for vessels above 10 feet draft of water, and one where a ship, well found in ground tackling, would ride out a gale.

Between the south end of Breakwater reef and the rugged point Si-ho-mai to the southward, the passage is full of rocks, with only from 4 to 6 feet water over them, and although greater depths of 2, 4, and 6 fathoms are also found, the channel is not safe for any vessel to take.

Supplies.—The inhabitants of this bay are mostly Chinese fishermen, several domesticated aborigines living with them. Fresh supplies were obtained, at first in small quantities and with exorbitant demands, subsequently an abundance was brought off to the ship, at more moderate prices. The rich and well cultivated plain of Kapchulan, only a few miles to the northward, must, from its character, be capable of adequately supplying all wants of shipping, should the bay become a treaty port and well frequented.

ANCHORAGE.—There is good holding ground in the outer part of Sau-o bay in 10 to 13 fathoms, black sand and mud, E. by S. of Breakwater reef and with the south point of the bay about South, but the anchorage is unsafe with easterly winds. The best anchorage is under Breakwater reef, but in rounding its north end, a berth of two cables must be given, to avoid the Serpent rock, of 11 feet water, which lies 1½ cables N.W. of the highest rock on the reef, (the clearing mark is the easternmost rock of the Sau-o reef in a line with a conspicuous rocky islet off the north point,) when vessels may haul to the southward, and anchor in 7 fathoms, with the conical or high rock bearing E.S.E. distant about 2½ cables; or if of 12 feet draught with the rock bearing East. The water shoals rapidly.

TIDES.—It is high water, full and change, at $5^h\ 50^m$, and the rise 3 to 6 feet. The tidal streams are weak in the bay; the flood sets along the coast south,* and the ebb north, with a velocity of 1½ knots per hour.

* According to Commander E. W. Brooker, R.N., who re-surveyed this bay in 1867.

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DIRECTIONS.—Approaching Sau-o bay from the northward, pass half a mile eastward of the Sau-o or Arlyi rocks, the highest of which may be seen 8 or 10 miles off in clear weather, and when Breakwater reef bears W. ¼ N. haul up for it. From the south-eastward vessels can boldly approach the South point, off which reefs extend 2 cables.

The soundings in the outer part of the bay from a depth of 11 and 12 fathoms between the inner points, increase gradually seaward to 17 and 20 fathoms, and decrease gradually towards the beach.

KALEEWAN RIVER.—At 6 miles to the northward of Sau-o bay and 10 miles S.W. ½ S. of Steep island is the entrance to the Kaleewan river, the waters of which irrigate a fertile plain about 13 miles long and 6 broad. At the time of the *Inflexible's* visit there were only 3 feet on the bar at low water, the rise of tide being from 2 to 3 feet. The surf broke heavily on the beach, and although there was an occasional break across the entrance, the vessel's gig entered in the wake of a junk without inconvenience; in going out, however, with the wind on shore two seas broke into and nearly swamped the boat. The junks, with their high bulwarks and great buoyancy, enter with comparative ease, the crews poling them across with bamboos.

The general direction of the river is S.W. The entrance is about a quarter of a mile wide, but just within it narrows to 200 yards. At 4 miles up it is only 50 yards wide, and thus far it has a general depth of 5 to 6 feet, clear fresh water. At 7 miles from the entrance the depth is 3 to 4 feet, but the river is scarcely broad enough to allow the use of a boat's oars.

The banks and country on either side of the river were everywhere under cultivation, principally with rice, Indian corn, and millet; sugar-cane also in small quantities. The inhabitants, composed of domesticated aborigines and Chinese, of the different villages scattered along the banks behaved with great civility. The aborigines are of a clear olive complexion, and in feature resemble the Malay. They are a much finer looking race than the Chinese, who have largely intermarried with them. They live in harmony with each other, both having the same dread of the Chiukwan or savage tribes of the mountains. The population of the plain is about 10,000.

STEEP ISLAND,* 14 miles northward of Sao-u bay and S.S.W. 11 miles from Samtiau point, the north-east extreme of Formosa, is inhabited by Chinese, and cultivated in terraces to its summit, which is a sharp conical peak about 1,200 feet above the sea. At its east end there

* The description from Steep island to Black rock bay (excepting Sau-o bay) is by Mr. W. Blakeney, R.N., H.M.S. *Inflexible*.

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is another peak, 800 feet high, which falls abruptly, and overhangs the sea; from its west side extends a large bank of sand or shingle, running out into a point westward, with deep water very close to. The *Inflexible* passed between this island and the coast, and had no soundings with 40 fathoms of line.

S.W. 1½ miles from Steep island is a small islet with a rock to the south-west of it.

SAMTIAU POINT, the north-east extreme of Formosa, is 10 miles N. by E. ¾ E. from Steep island. The point itself is low and flat, but a little inland is a hill range which terminates in a bluff. Here the coast line turns abruptly to the north-west for 30 miles, and midway is the harbour of Kelung.

PETOU POINT, N.W. by N. 7 miles from Samtiau, is a peninsula 400 feet high, and from a distance appears like an island; the small boat harbour and fishing village of Petou is close to the westward of it. The coast from thence to Kelung harbour is steep-to, all the off-lying rocks which are of sandstone, showing above water. The most remarkable feature on this coast is Dome peak, which makes in that form from the north-east. The mountain ridge extending S.W. from Petou point rises to the height of 2,800 feet.

At 5 miles westward of Petou point is the entrance to Chimmo bay, in which a vessel might anchor if in distress, or forced in by a northerly wind. The depths are 4 to 10 fathoms at entrance, and 5 and 4 fathoms at head of the bay, under the lee of the point on its eastern side; this point is foul, and should be given a berth in entering.

KELUNG HARBOUR AND ISLAND, 4 miles West and N.W. respectively from Chimmo bay, are described at page 298.

Directions for making the passage along the East coast are given in Chapter I., page 39.

WEST COAST OF FORMOSA.

South Cape to Kelung Harbour.

The following description of the west coast* of Formosa embraces the south coast from South cape; the west coast with the ports of Ta-kau and Tamsui; and the north coast, as far as, and inclusive of, the harbour of Kelung and adjacent bays.

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* *See* Admiralty Charts:—Formosa island and strait, No. 1,968; scale, $d = 6 \cdot 5$ inches; and Hong Kong to Liau-tung, No. 1,262.

For winds and weather *see* page 7. Heavy storms on the south-west coasts, of a remarkable character, in some respects resembling typhoons, have lately been recorded in November and March.

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During recent years our knowledge of the western coasts has been greatly improved by detailed surveys, now complete from Tamsui to the South cape. Richards' survey of the coast from Ta-kau to Kok-sikon has been extended southwards and northwards by Messrs. Wilds and Stanley, of H.M. surveying vessels *Swallow* and *Dove*, and Commander E. Brooker, of H.M.S. *Sylvia*, in 1867, joined the work of the latter with that of Lieutenant Gordon, of H.M.S. *Royalist*, at Tong-siau. The description of the coast has been compiled from the directions of those officers and of Mr. William Blakeney, R.N., who explored part of the coast in H.M.S. *Inflexible* in 1867, together with the remarks of various commanding and navigating officers of ships which have been stationed at the Treaty Ports.

South Coast of Formosa.—The South cape of Formosa, already described on page 264, is the southern extremity of a mountain range extending several miles to the north-west. Westward of the cape is a large bay, Kwa-liang, which is formed between the cape range and the hilly promontory of Gooswa, of moderate height, of which Black point is the southern termination.

KWA-LIANG BAY.—Black point is 6 miles W. by N. from South cape. From it the western side of the bay runs N.N.E. 2½ miles to its head, where is a white sandy beach which shows out conspicuously under the dark land. Off this beach at about 4 cables distance from the shore, with the peculiar bluff that forms its western extreme bearing N. ½ W., good anchorage may be found in from 7 to 8 fathoms water. If approaching this anchorage from the western side of the bay, care is required to avoid the rock *awash at high water*, lying N. 56° E. 7 cables from S.W. point. The eastern shore is under the cape range, the two highest parts of which 1,035 and 1,083 feet above the sea, are directly over the middle part of the bay. Three black rocks, 10 feet high, easily distinguished and steep-to, lie within half a mile of the shore, one on the west the other two on the eastern shore, almost equidistant from each other; and 2 miles from the cape, projecting from the hill side is the Chess-board a remarkable mass of limestone, a famous legendary rock of the Chinese.

Within the bay at 1½ miles from the shore, the depth off Black point is 60 fathoms, off the head of the bay 40 fathoms, and off the south cape 28 fathoms.

Anchorage.—In the N.E. monsoon good anchorage will be found in 10 or 12 fathoms, about half a mile from the shore, anywhere on the north and north-east sides of the bay. The *Dove*, during the survey, anchored on two occasions; on the first at half a mile from the south cape, where

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great caution is necessary in coming to, on account of a strong eddy or counter current, which sets to the south-east at the rate of 4 knots, and the tide ripple off the point is very heavy. The other anchorage was off the middle sandy beach on the east side of the bay, under the highest part of the cape range, with Black head W.S.W.

Caution.—The natives of the south were formerly hostile to strangers. During the survey of the coast in 1864, the *Dove's* boat was attacked and the surveying party narrowly escaped being cut off. This state of things has been put an end to by the Treaty of 1867, see page 263.

SOUTH-WEST POINT, one mile west of Black point, is the angle of the coast where it turns to the northward. The small bay of Chim-kong-ho north of it, has 23 fathoms at half a mile off shore, and 52 fathoms at a quarter of a mile off its north point where are strong tide ripples.

GOOSWA PROMONTORY extends in a N. by W. direction 7 miles from south-west point. It shows little difference of elevation, its two highest parts at 2½ and 5½ miles northward of the point, being 538 feet and 627 feet high respectively. The hills about this part of the coast are mostly bare, their summits only being wooded, and there are no villages, but only a hut here and there along the shore. The promontory is backed by an inland range, Ba-swa, the summit of which, rising to the height of 2,235 feet, is 8 miles N.N.E. ½ E. of south-west point, and terminates to the southward in the remarkable craggy peak 1,083 feet high, over Kawa-liang bay.

The bold shore of the promontory consisting of dark rocky cliffs is steep-to, with 150 fathoms at a mile, and 50 fathoms at half a mile, except in the bight of the coast, where at the latter distance the depth is only 16 fathoms. Its most conspicuous feature is the sand beach of Chim-kong-o bay. When approaching the promontory from the northward it appears as an island; its northern point terminates abruptly seaward, but slopes gradually towards the plain.

AOU-WA-NAH is a nook at the head of the small bay which lies immediately north of Gooswa promontory, and between it and a point on which is a small isolated hill, Bay hill, 235 feet high.* The reefs from either shore meet within a cable, forming the entrance to a basin about 2 cables in diameter, having a depth of 5 to 3 fathoms.

From this, northwards, the coast is inhabited by Chinese who move about armed for protection against the natives with whom they carry on a perpetual warfare.

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* 100 feet high, Commander B. Bax, R.N., 1874.

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LIANG-KIAU or EXPEDITION BAY, (or Lang-kiu), fronts a level tract of land, 3 miles in extent, and is formed between Bay hill and Lang-kiu point, 2 miles north of it, which is the sandy projecting point of the low grassy flat, stretching from the foot of the hills, and off which the low-water rocks extend 2 cables with 18 fathoms at 4 cables.* On the bay, a little removed from the beach, is the walled village of Lang-kiu, and north of Bay hill, where the bushes come down near the shore, is the outlet of a small river, which is dammed at its mouth.

The bay is open to all westerly winds, but affords good anchorage in the N.E. monsoon from the depth of 9 fathoms, sand, between the outer points, decreasing gradually towards the long sandy beach. The approach to the bay is quite clear, and the soundings deepen outside rapidly to 20 fathoms at 1¼ miles, and 40 fathoms at 2 miles from the beach.

Lang-kiu is the principal town or village of the district, and the most southern settlement in which Chinese authority is recognised, practically at least. It contains about 1,000 Chinese, is walled, and has a ditch round it, with plank bridges crossing to the two gates. A practicable military road which now connects Lang-kiu and the entire south with the capital owes its construction to the fact of the S.W. monsoon closing the communications by sea, in July 1867, when the expedition was being fitted out against the hostile natives of the south.†

SAN-LIAU BAY is north of Liang-kiau point, and between it and a sugar loaf hill, 411 feet high, which lies under the Le-liang-swa mountain. This bay, which affords anchorage in 3 fathoms at 3 cables from the shore, was the rendezvous of the junk squadron, which brought supplies to the expedition against the natives, when all the other landing places south of Ta-kau were rendered inaccessible by the monsoon. All the low shore of Liang-kiau point is bordered by an extensive reef; and on the north shore of the bay are some villages of Chinese squatters who are not under control.

LE-LIANG-SWA is a mountain range on the coast north of Liang-kiau, extending 6 miles north and south. The two southern summits of it rise to the height of 2,263 and 2,437 feet, and the northern one which when seen from the north and west makes like a pap, to 3,365 feet.

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* According to the survey of Messrs. Wilds and Stanley, R.N., in 1865.

In the Remark Book of Nav. Lieut. Neville, of H.M.S. *Cormorant*, 1869, there is a statement that a shallow sandy spit runs out three-quarters of a mile from the north point of the bay, on which account vessels are recommended not to hug the shore too closely.

† About 5 miles N. by W. from Liang-kiau bay, when not in soundings, the leadsman struck what must have been a peaked rock at 9 fathoms, which caught the lead line and nearly pulled the leadsman out of the chains.—Remark Book of Lieutenant Eaton, R.N., Commanding H.M.S. *Flamer*, 1865.

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HONG KONG, or Kan, 6 miles north of Liang-kiau point, is a large Chinese village of Chang-chow men who have a few boats, but fish little. The hills around are densely wooded. The villagers are permitted by the savages to cultivate a valley among the hills, on payment of a tribute of one bag of rice out of every forty-five.

CHE-TONG-KA, or Chitong kiau hong, N. by W. 13 miles from Gooswa promontory, and 4½ from Hong-kong, is on a point, bordered by a reef, which projects half a mile from the foot of the high land; the coast is bold and steep-to, the hills in some places descending almost to the water's edge. Vessels can anchor anywhere along the coast in 8 or 9 fathoms, finding good shelter from winds ranging from North round to S.S.E. Two miles north of Che-tong-ka the bold land terminates at the foot of a hill 1,340 feet high, whence the mountain range trends to the northward and the shore, which is low and level, to the N.W.

PONG-LI, or Pong-liau, is a small Chinese town 7 miles N.N.W. ½ W. of Che-tong-ka, and a short distance inland, about a mile northward of a remarkable square clump of trees on the beach, called Kay-a-kaou. H.M.S. *Inflexible* anchored abreast the town in five fathoms, about 3 cables from the beach. Landing was effected in Chinese catamarans, the surf being too high for the vessel's boats, although there had been but little wind the three previous days.

Pong-liau, situate on the verge of the great western plain of Formosa, is isolated from the south by a chain of mountains which terminate almost perpendicularly towards the sea, and whose plateaux are occupied by savages of the Bootan tribe.

The shore between Pong-li and Tang-kang, north-westward, is a low sandy beach; but a short distance inland are numerous clusters of bamboos and Chinese houses, and a country highly cultivated. The depths are 8 to 9 fathoms at 1 mile from the beach, except in the bight into which the river Tang-kang flows, where the depth at half a mile is 50 fathoms, and at 2 miles off shore, 140 fathoms.

LAMBAY ISLAND, or Lammay, or Seo-liu-kiu, in lat. 22° 20½′ N., long. 120° 22½′ E., the only island off the west coast of Formosa, is visible 18 miles, and in formation is very similar in appearance to Ape hill over Takau. Its summit is flat, the most elevated part being 258 feet. The island is 2½ miles long in a N.E. direction with an average breadth of a mile, and its shores are fringed with coral; the northern shore is rugged with a few small sand beaches; the south-eastern has a sand bay half a mile in extent near the middle; and it has high yellow cliffs on its western side. The most conspicuous point is the north-eastern which is round,

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and composed of fine white sand. Houses, inhabited by Chinese fishermen, are scattered over the island. No anchorage can be obtained near this island, as within a quarter of a mile there are 30 and 40 fathoms water.*

The TANG-KANG, a comparatively large and rapid river, has its entrance N.N.E. 7 miles from Lambay island and 11 from Pong-li; at low water there are only 4 feet on the bar, which shoals suddenly from 20 and 30 fathoms.† The entrance can generally be distinguished by the junks which are moored on the north bank of the river, as also by a clump of trees about 2 miles inland, which stands a little distance to the northward. The town of the same name stands on the south side of the river near the entrance, and has about 20,000 inhabitants. The principal export is rice, which is carried in junks of small size. Between Tang-kang and Lambay is a remarkable depression in the sea bed, which in some places is nearly 200 fathoms in depth. This is probably the submerged crater of a volcano, six miles in diameter, and Lambay island would appear to be an elevation on the southern part of the lip. Abreast of the river is the only place between Ta-kau-kon and Liang-kiau bay where a ship cannot find good anchorage in the N.E. monsoon.

HONG-PE-TAOU, a rocky point between Tang-kang and Ta-kau-kon is the termination of the smooth and slightly-rounded Hong-swa hill, which is 468 feet high. Between the hill and point is a well marked saddle hill 259 feet high; which, when seen from the north or south, appears as two chimneys. Towards Ta-kau-kon, 13 miles to the north-westward the coast is low and bushy, and is inhabited by fishermen who live in scattered houses. The large lagoon which terminates the harbour of Ta-kau-kon, stretches up to within 2 miles of Hong-swa hill, leaving only a narrow strip between it and the coast.

APE HILL and SARACEN HEAD.—Ape hill, 1,110 feet high, called by the natives Ta-kau, is N. by W. ½ W., 18 miles from Lambay island. It appears like a truncated cone, on a North bearing, sloping towards the land side, making at a distance like an island, and can be seen in clear weather 35 miles; its barren, rugged sides rise with a steep slope from the sea facing which is a large white land-slip. At

* Captain Ross, I.N., who examined this island in the *Discovery*, states that about 3 miles eastward of the island a bank of soft mud commences, which, extending 7 miles off Formosa, has soundings on it of 15 to 26 fathoms. A reef runs off about a mile between the south-east and north-east points of the island, with 25 and 30 fathoms water close to its edge.

† The singular depth of water at the entrance of this river marks it as capable of great improvement should the extension of commerce in the future render it necessary.

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4½ miles N.E. of Ape hill is another remarkable hill, 700 feet high, which, from its resemblance to a huge whale sleeping on the water, is named Whaleback; and N.N.E., 12 miles, there is a small triangular-shaped hill, and a large detached piece of table-land resembling a quoin on a North and South bearing. These are the only landmarks on this part of the coast, which is all very low, and of these Ape hill is the most useful, as it stands out on the coast line, and is frequently seen distinctly when all the others are shrouded in mist.

Ape hill is a vast block of coral, its summit resembling a crater, and most probably it is an extinct volcano which has been alternately submerged and upheaved. From its summit the land descends to the southward in a gradual though somewhat rugged slope, and terminates in a small green looking mound separated from Ape hill by a chasm.

Saracen head, farther south, is 175 feet high and surmounted by a signal staff, a huge nearly level block of a mole-like appearance, bounded on the sea face by a line of precipitous cliffs rising from the water's edge, and which, jutting through the beach to seaward for about 300 yards, forms a sheltered harbour for small vessels in the strength of the N.E. monsoon. This mole is separated from the hill by a deep channel about 60 yards wide, which is the entrance to the Little port of Ta-kau kon.

LIGHT.—On 19th November 1883, a light was exhibited from a lighthouse erected on the highest (north) part of Saracen head, southern approach to Takow (Takau) harbour :—

The light is a *fixed* white light, visible seaward between the bearings of N. 36° W. and S. 20½° E.; it is elevated 164 feet above the sea, and should be seen in clear weather from a distance of 10 miles.

The illuminating apparatus is dioptric.

The lighthouse, 16 feet high, is constructed of brick and painted white.

Position approximate, lat. 22° 36′ 15″ N., long. 120° 16′ 00″ E.

Ryder rock.—A rock awash at high water, was reported by H.M.S. *Frolic*, 1876, as lying with rocky bluff on Apes hill, bearing E. by N. The rock is about 3½ cables off shore, and there is said to be a 5-fathoms channel between it and the shore.

At a distance of one cable S.W. ¾ W. from Ryder rock is another rock having a depth of 13 feet at low water springs.

Anchorage in the N.E. monsoon is good and safe under Ape hill, which stretches out so as to afford smooth water. In the S.W. monsoon heavy rollers come in making it undesirable to remain at anchor there.

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TA-KAU-KON,* or harbour of Takau, the Consular port of Taiwan fu, is a small basin just within the entrance of a great lagoon, 6 miles in length and 1 to 2 in breadth, which runs parallel to the sea, from which it is separated by a strip of sand extending southward from Saracen head, and which is bounded on the North by a rich plain through which winds a little river.

The entrance to the harbour is immediately North of Saracen head, where the fair channel is only 200 feet wide.

The Bar is formed by a narrow ridge of sand, curving outwards and extending from under the bluff of Saracen head round towards the shore at half a mile north of the entrance. It consists of loose sand and is constantly shifting, both when freshets occur, and in the S.W. monsoon, when wind and swell oppose the strong tide sweeping out of the lagoon. In the same monsoon in bad weather the sea breaks heavily over it, rendering it impassable for a week or 10 days afterwards.

Though in 1877 a vessel drawing 12 feet water crossed with safety, this must be considered as an exceptional occurrence, since in the same year it was reported to have shoaled to only 7 feet at low water, and 10½ feet at high water; in consequence of the frequency of these changes in the depths over the bar, no vessel should attempt to enter without a pilot; nor should any, of more than 5 feet draught make for the harbour in heavy weather.†

The Harbour is immediately within the entrance, which is steep-to, quite safe of approach, and has a depth of 4 fathoms; inside the water quickly deepens to 7 fathoms, again decreasing to 5. The anchorage is too confined to allow a vessel to swing, it is therefore necessary to moor head and stern. It is further contracted by a middle ground of sand, the spit of which, 100 yards within and facing the entrance, reduces the breadth of the harbour on either side to 200 feet, and ships being towed in and out frequently ground on it. In 1873 there was water only for vessels drawing 9 feet, larger vessels having to anchor outside the bar.

On the north side is the custom house and harbour master's office, also the British Consular Office, a red brick building close to the shore;‡ and here lie the merchant ships alongside the jetty of the custom house godowns where there is a good depth of water. The British gunboat, which visits the port monthly, lies about 200 yards higher up.

* *See* Plan of Port Ta-kau-kon, scale, $m = 8\frac{1}{2}$ inches, on Admiralty Chart of Harbours in Formosa, No. 2,376.

† In 1879 H.M.S. *Mosquito* found 13 feet on the bar, which was extending to the eastward inside. A spit is forming from the bank in the middle of the harbour, and extending towards the northern shore.—Nav. Lieut. C. Jeffery, H.M.S. *Mosquito*, 1879.

‡ Idem.

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The consular residence stands on a hill at the north side of the harbour, and forms a conspicuous object from seaward.*

The Chinese town or village stands on the south side at the back of Saracen head. Its population is about 1,000, of which the chief part are fishermen. Here are the residences of the Chinese commissioner of customs, the medical man, and the missionaries; there is also a small Chinese hospital.

SUPPLIES, Trade, &c.—Excellent water can be obtained from a spring on the north shore, but not in any large quantity; the price charged is high, viz., 1½ dollars per ton, and care must be taken that it is not procured from the wells on the south side, which are brackish and contaminated with the sewage of the town. Fresh beef of very inferior quality is supplied, also fruit, vegetables, pigs, fowls, ducks, eggs, rice, sugar, and fish.

Takau was opened to trade in 1864, but as its importance arises from the fact of its being the port of Tai-wan fu during the S.W. monsoon, and the only accessible one where ships can then lie with safety, its trade is chiefly limited to that period. In 1881 the number of vessels of all nations entered and cleared was 322, while the gross foreign trade amounted to 1,181,343*l.* sterling. Sugar and rice are the principal exports; opium, cotton and woollen goods, the principal imports. There is frequent steamer communication between Takau and Amoy.

Climate.—The climate of Takau is hot, but nevertheless healthy, and is never cold at any period of the year. There are no records of the prevalence of any special disease likely to affect the European settler.

PILOTS, Signals.—There are two European licensed pilots (besides Chinese). They are under the superintendence and regulations of the harbour master, from whom they obtain their certificate. One is usually to be found awaiting the arrival of ships. Their charge is usually 90 cents per foot of draught.

The signal station on Saracen head, from which all vessels sighted are signalled, is also under the direction of the harbour master.

TIDES.—It is high water, full and change, at Takau, at 8 h. 30 m., springs rise 4 feet. The tides are rather strong when near the springs, and at times sweep through the narrows with great rapidity, on account of which it is generally recommended to go in and out at slack water.† The day tides are higher than the night tides in the S.W. monsoon, and the reverse in the N.E. monsoon.

* Nav. Lieut. C. Jeffery, H.M.S. *Mosquito*, 1879.

† Tides are irregular, a.m. tides in S.W. monsoon, and p.m. tides in N.E. monsoon only, to be depended on.—Commander B. Bax, R.N., 1874.

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DIRECTIONS.—The entrance of Takau is easily distinguished and unmistakable, Ape hill, the only high land in the vicinity standing out prominently, and Saracen head on its south side, appearing as a detached portion, being no less conspicuous. If obliged to run for the entrance in bad weather, bring it to bear E. by S. ½ S., and run boldly in, keeping the northern shore close aboard. As the rocks are neared, starboard the helm and round the northern head close to, shooting into a little sandy bay, where a vessel may touch the ground with her forefoot without sustaining any damage, afterwards hauling into a berth, and mooring head and stern. Small vessels drawing 8 and 9 feet can run past the moored shipping, keeping the northern head on a West bearing, anchoring in less than 2 fathoms, and veering chain just sufficient to swing clear.

Or—In entering keep close to the outer North rock (steep-to), and haul close round the point, but not within 10 yards as there is a rock inside, within that distance, with only 4 feet on it at low water. Pass the vessels at the wharf as close as possible, and when beyond them or the last house, which has a flagstaff in front and stands about 280 yards from the entrance, haul out a point or so, taking care to avoid the vessels' anchors, and there is good anchorage at once in 11 feet, fine dark sand, and though confined, still with room to moor with one or two shackles on each cable and swing clear. (*From remarks of Com. Rising, R.N.*, 1870.)

Great care is required if entering at springs on the ebb, which runs at the rate of 4 or 5 knots through the entrance, for should the tide catch the vessel on the bow, she might sheer to one side of the harbour before the helm would bring her head right.

The harbour is difficult of exit in the S.W. monsoon, and vessels are sometimes detained three weeks. They have generally to be towed out against the heavy swell by catamarans, assisted when necessary by a warp made fast to a ring bolt in the cliff on the south side of entrance.

The harbour is said to be shallowing year by year.* At present, at the outside, it can contain twelve vessels of 12 feet draught, moored head and stern; but it is susceptible of great improvement at small expense, and as the trade of Formosa increases this place must advance in importance.

PASSAGES between this port and Amoy will be found in the first chapter of this work, at page 47.

TAKAU to ANPING.—The coast, northward for 20 miles between Ape hill and the old Dutch fort of Zealandia, is nearly a straight line of beach pierced by four small streams, navigable only for boats; and, from within 8 miles of Ape hill, where some low mud cliffs terminate, and where

* Navigating Lieut. H. R. Robinson, of H.M.S. *Espoir*, writing in 1883, says the services of a pilot are quite necessary, and the chart unreliable, as the banks are continually altering.

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also is situate a small piece of table land about a mile inland, is destitute of any remarkable feature. Southward of Tai-wan fu the main land of Formosa approaches within a mile of the sand bars fronting the coast, and although it is generally marshy and flat, it is cultivated with rice, &c. The sand-bars are also occasionally clothed with bushes and grass, and are densely populated by fishermen, who appear to be well fed and clothed and a happy and contented people, and pursue their vocation generally in divisions under the direction of particular chiefs; and their rafts hauled upon the beach, placed in tiers on their sides, form a feature in the appearance of the coast. Whenever the officers of H.M.S. *Saracen* landed they were treated with the greatest civility and deference, and the surveying marks, although sometimes made of an article most tempting to them (white calico), were never in one case interfered with.

FORT ZEALANDIA.—The old Dutch ruined fortress, Castle Zeland, built in 1630, has been pulled down and the material used to build a large fort on which 6 eighteen ton guns are mounted. The New fort is situated on the coast to the southward of Anping. The large tree still remains. There is a large clump of trees $1\frac{3}{4}$ miles N.W. of the fort on the outer sand-bar. The old fort stood about two thirds of a mile from the sea, and about its position has grown up, along the continually rising mud and sand banks, the village of Anping.

Light. — About 100 yards to seaward and directly in front of the Tree is exhibited from a mast, a fixed white light. It is elevated 60 feet above high water, visible from N.E. through W. to E.; the illuminating apparatus is dioptric of the 6th order.

Anchorage. — During the N.E. monsoon vessels may anchor anywhere, in from $4\frac{1}{2}$ to 5 fathoms; with the light bearing between N. 62° and N. 73° E. In the S.W. monsoon the best anchorage will be found in from 6 to 7 fathoms with the light bearing about N.E.*

ANPING ROAD.—This anchorage off an opening in the beach, which is the nearest approach to Tai-wan fu from the sea, is an open roadstead where, during the strength of the N.E. monsoon, from December to March, capital sheltered anchorage with smooth water may be found, in $5\frac{1}{2}$ fathoms, at 2 miles S.W. of fort Zealandia. During the rest of the year the chances of S.W. winds render this position an unsafe one, and anchorage should be sought further out, but in the strength of the S.W. monsoon no vessel could lie off a coast so fully exposed to its full force, and the heavy rollers which accompany it.† Then also the bar is most dangerous, and cannot be passed by the cargo boats for days and weeks

* From remarks in Light list of the Chinese Imperial Maritime Customs for 1884.

† Remark Book of Nav. Lieut. Richard W. E. Middleton, H.M.S. *Cockchafer*.

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together.* Catamarans are used as at Takau, and are managed by the Chinese with great skill. Trade ceases entirely for four months, viz., from June till September, all goods being then sent to Takau for shipment. The anchorage should be approached from the northward with caution, and the lead used constantly as two sand banks dry at low water have recently (1877) been visible about 2 miles to the North of the roadstead and about three-quarters of a mile from the shore. Also between port Kok-si-kon and Anping anchorage, the edge of the shoal water fronting the shore is said to be extending considerably to the southward and westward.

Anping has a population about equal to Takau. There is a resident mandarin, and a superintendent and tide-waiters of Chinese customs. The British consul, a medical missionary, and a surveyor of customs reside at Tai-wan fu. Excellent fresh water is supplied from the latter place.

Between Anping and Tai-wan fu, 2 miles S.E. from the fort, is a large expanse of mud flat which at times during the S.W. monsoon is entirely covered with water. A narrow creek or canal runs up to the west gate of the city, by which cargo boats can go up at high water.

TAI-WAN FU, the capital of Formosa, is a prefectural city of 70,000 inhabitants,† surrounded by a wall 20 feet high, quadrangular, and 5 miles in extent. Within it are the residences of the Tao-tai, the mandarins, and the chief citizens. The country around is cultivated and highly fertile, producing sugar and rice. To seaward lies an extensive suburb containing the chief markets and where the bulk of the business of the town is done. There are about 3,000 troops in the city commanded by a Chuntai or general, but the mandarin rule is so weak that it is unable to maintain order even in the immediate neighbourhood. Rice and sugar are the principal exports; the imports are opium, cloths, and miscellaneous goods in small quantities. *See* Takau, page 278.

Climate.—The winter is healthy and pleasant, with a clear, bracing air and not so cold as Hong Kong. The N.E. monsoon is very little felt, being intercepted by the mountain ranges, but when it blows a norther the air is filled with sand and dust which penetrates the houses and is very disagreeable outdoors. In summer the heat is oppressive, for the fine S.W. breeze which blows upon the coast is lost before it crosses the

* The bar was crossed in 1869 by H.M. gunboat *Bustard*, drawing 7 feet, but its channel is constantly shifting and, like the harbour within, shoaling rapidly. The same change is taking place all about this part of the coast, for where good harbours existed formerly with 15 to 20 feet water, there is not now sufficient to float a junk. According to Dutch and other records, the sea at one time extended to the fort inside the city.

H.M. ships are now prohibited from entering this harbour, by order of the Commander-in-Chief.

† In 1874.

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plain, and sometimes for days together the thermometer never falls below 90°, rendering the nights unbearable, and in the daytime it frequently reaches 100°. The Europeans then go to Takau to enjoy the sea breeze and a more endurable life. Heavy rains occur in the summer season.

VUYLOY SHOAL.*—This dangerous sand-bank, about half a mile in extent, and with only 8 to 12 feet on it at low water, lies upwards of mile off shore, S. by E. 4½ miles from the entrance of port Kok-si-kon, W. by N. ¾ N. 4½ miles from fort Zealandia, and S.W. by W. ½ W. 2¾ miles from Joss islet. With southerly winds the sea breaks heavily on it, but with off-shore or north-east winds there is but little break. The soundings are 4½ to 5 fathoms at 1½ miles westward of the bank, and 3 fathoms between it and the shore.

Vessels bound from Kok-si-kon to Ta-kau, will pass westward of this shoal, by keeping 3 miles off the sand bars fronting this part of the coast or not shoaling to less than 4½ or 5 fathoms, until fort Zealandia bears East.

TIDES.—The flood stream sets in a N.N.W. direction from 1½ to 2 knots an hour along this part of the coast. The ebb runs S.S.E. except near the entrance of Kok-he-mung, 3¾ miles N.W. of Zealandia fort, where its direction is S. by W. out of the harbour.

PORT KOK-SI-KON, the north point of entrance to which, (Gull Point,) is 32 miles N.N.W. of Saracen head, can only be recognised by the number of large junks generally at anchor inside, and by three larger clumps of huts than can be found on any of the outer sand-banks which front all this part of the coast, and which are elevated only 2 or 3 feet above high water. These banks run in lines, generally parallel to the coast, from 2 to 5 cables broad, and are pierced at every mile or so by narrow channels, having depths varying from 7 feet and under. There is no vegetation in sight from the western sand bar; the main land of Formosa can only be seen in very clear weather from it, and the whole intermediate space seems to be an intricate mass of sand and mud banks and shallows, with occasional patches of sedge.

These sand-banks are occupied by a few poor fishermen, whose miserable huts and bamboo rafts are the only relieving features of this dreary scene. Ape hill to the southward, and the southern islands of the Pescadores to the westward, will be found useful marks to run in for Kok-si-kon, which bears N.N.W. 30 miles from the former, and E. by S. ¾ S. 26

* Mr. W. Blakeney, R.N., 1858.

The banks north-west of Vuyloy shoal are extending to the westward.—Remark Book of Nav. Lieut. Neville, H.M.S. *Cormorant*, 1869. Nav. Lieut. R. J. Rogers, of H.M.S. *Growler*, writing in 1875, also remarks that the Vuyloy shoal appeared to have greatly increased, and that at West point the banks had extended very considerably.

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miles from East island, Pescadores. The old Dutch fort of Zealandia is just in sight from the anchorage, from which it bears S.E. ¼ S. distant 7½ miles.

This port is the outlet of several small shallow streams which here unite and form a channel through the mass of sand-banks fronting the coast. This channel or port runs N.E. and S.W., and, taking the 3-fathoms line as its boundary inside, is three-quarters of a mile long and only 2 cables broad, with 4½ fathoms in the middle; it will be therefore necessary to moor N.W. and S.E. The bar has 12 feet on it at low-water springs. The deepest part is generally marked by the natives with bamboos; but as the channel is both wide and straight and the bottom remarkably even, it is by no means difficult of access for vessels of 12 or 13 feet draught at high tide. The *Saracen*, in 1855, sailed in drawing 13 feet 2 inches, but then the sea was remarkably smooth; vessels, therefore, drawing over 13 feet should not attempt to enter, particularly with any swell on. (*See* page 285.)

TIDES.—It is high water, full and change, at port Kok-si-kon, at 11 h. 30 m., springs rise about 3 feet. The tide inside the bar sets fairly through the channel; its greatest strength being about a knot. Outside the bar the flood sets northward, along the coast, the ebb southward; its rate varies in different positions, running with much greater strength off the west sand bar or the edge of the deep water than in the shoal water bight off Taï-wan, where it is occasionally variable in strength and direction.

DIRECTIONS.*—The high land of Formosa, immediately over port Kok-si-kon, may be distinctly seen in very clear weather from the Pescadores, but as it is generally obscured, and the coast low and sandy, it will be prudent at all times when bound to that port from the westward, to be certain of the vessel's position before losing sight of East island, or one of the southern islands of that group.

The mast heads of a large fleet of junks usually at anchor in the small harbour of Kok-he-mung, 5 miles S.E. by E. of Kok-si-kon, will serve as a guide on approaching the coast; and when 3 or 4 miles from the shore, three clumps of huts and trees (the southernmost clump abreast West point being the largest and most conspicuous,) Joss islet, and fort Zealandia, are objects sufficiently well defined to mark the locality. Joss islet has a clump of dark trees on its southern end, and the Joss house on has a white front to seaward. Ung-lo and So-co, to the south-eastward, are remarkable hills, and may generally be seen when the mountains in the interior are hidden. The clouds sometimes rests upon them, when they

* Mr. W. Blakeney, R.N., 1858.

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appear as the highest land in the vicinity. Ung-lo, 1,080 feet high, is the southern termination of a long table range which falls steeply for a few hundred feet, and rises again to the round hill of So-co, 880 feet high.

Caution.—The *Inflexible* in 1858 anchored in 6 fathoms off Kok-si-kon, Observatory point, the south point of entrance, bearing N.E. by E. 1½ miles. The wind being light from South, an attempt was made to enter the port in the vessel's boat, but it was unsuccessful, as the sea broke the whole way across the entrance. The Chinese fishermen stated that the channel and sand-banks have altered considerably since surveyed by Richards in 1855. There were no junks at anchor in Kok-si-kon, but the harbour of Kok-he-mung was crowded with them. A party from the vessel landed inside the latter harbour, and visited Tai-wan fu, the capital of the island. They were civilly received by the authorities, who sent off presents of pigs, goats, fowls, sweet potatoes, &c.

The COAST for 20 miles to the northward of fort Zealandia has no distinguishing feature, the highest bushes and huts being but a few feet above the low level land.

KAKAOU, 7 miles northward of Kok-si-kon, is a temporary fishing village, standing on the north bank of a small and narrow inlet, in the entrance of which there are 5 to 7 fathoms, but only 8 feet on the bar immediately outside; only boats can enter, and when blowing a strong monsoon it is attended with difficulty, as the sea breaks the whole way across.

PAW-TAY-CHUI is N.N.E. ¼ E., 11 miles from Ka-kaou. The coast between is a low narrow strip of sandy land, which is only 4 or 5 feet above high water. The town is a mile from the entrance, the inhabitants of which are piratical, and often bid defiance to the mandarins. The entrance to this small inlet is from the N.N.W., and also difficult of access when the monsoon has any strength. S.S.W. of the town of Paw-tay-chui and 1¼ miles inland, is a mound covered with trees and huts, the native name of which is Ang-hay-kang; it is the most conspicuous landmark between Wanckan and Kakaou. West of this are sand-banks and shallows which project nearly 2 miles outside the general run of the coast.

From the entrance of Paw-tay-chui the coast, still skirted by sand-banks and shallows, trends N. ½ W.; the trees inland are thicker and more continuous than to the southward, and at a part about 6 miles northward, the extreme of the trees appears as a bluff.

Ay-aw Banks.—Four miles W.N.W. of the entrance to Paw-tay-chui, is a sandy patch of 2 fathoms at low water, which must break heavily in

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the S.W. monsoon; and a mile N.W. of it is another bank of 16 to 18 feet, 2 miles in extent; these are at the outer part of the bay formed between Paw-tay-chui and the Wanckan banks, and within them the channel carrying 4 fathoms, is 3 miles wide. The depths are 7 fathoms at 2 miles off shore from Kakaou to Ang-hay-kang mound, and also one mile outside the above shoals; but they deepen to 40 fathoms, fine dark sand, at that distance outside the extremity of the Wanckan shoals.

AY-AW CREEK is at the northern part of the bay, formed by the Wanckan banks and the low opposite shore; it runs north and south for a distance of 4 miles, and in some places is 2 miles wide. A narrow channel with 10 feet water can be traced out, which for junks and small vessels affords anchorage and shelter. In the S.W. monsoon entering the inlet would be attended with almost certain destruction, but in the N.E. monsoon good shelter can be obtained outside. Sugar is the principal export, which is shipped in junks of about 200 tons burthen. This small place has much deteriorated during the last few years.

The creek is approached from the south-west, between the Ay-aw banks and the south Wanckan shoal.

WANCKAN or CHIN-NE-YAH BANKS* form the westernmost part of the island of Formosa. The small sandy patch on the south end, on which a hut is erected, is only one or two feet above high water, and is in lat. 23° 31′ N., long. 120° 2′ E., 24 miles northward of Kok-si-kon. To the southward, the bank at low water dries nearly 2 miles, and continues in a N. by E. direction for 11 miles. S.S.W., 3 miles from the hut, is a patch with only 4 feet on it at low-water. The Wanckan bank and shoals may be considered the great dangers of the Pescadores channel, and the Chinese say that there are many junks and ships lost on them during the year. When coming from the north or south there are no landmarks to guide the navigator, and the strong tides experienced render a ship's position at all times doubtful.

Outer Wanckan Shoal is a sand-bank 3 miles in length, and running parallel to the southern part of the Wanckan bank, with from 2 to 3 fathoms on it; this in the S.W. monsoon breaks with great violence. The *Swallow* and *Dove* whilst sounding the channel in September 1864, anchored in 20 fathoms off this shoal, and as far as the eye could reach, nothing could be seen but one continuous line of breakers.

TIDES.—It is high water full and change at the Wanckan banks at 10h. 0m., springs rise 10 and neaps 5 feet. The tide turns at high and low

* Formerly called the Wanckan reef; they consist, to all appearance, entirely of sand.

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water by the shore, the flood running to the N.N.E. at 3½ knots per hour, the ebb in an opposite direction, and not quite so strong. Between Wanckan and Kakaou the tides do not attain a greater velocity than 1½ to 2 knots, and run parallel to the shore. This high velocity of the northern stream is attributed to the influence of the Japan current which splits upon the south part of Formosa.

PESCADORES CHANNEL.* — The Pescadores islands, described on page 237, lie 20 to 30 miles westward of the Wanckan bank. The Pescadores channel between them is 30 to 60 fathoms in depth, and is narrowed to a breadth of 9 miles between Outer Wanckan shoal and the Nine-feet reef which lies W. by S. ¼ S. from it, and which is 4 miles S.S.E. ½ E. of Three island, the easternmost islet of the Pescadores group. *See* page 244.

WANCKAN to QUANG-WA.—From the hut on the sandy patch of the South extreme of the Wanckan banks to the northward, the coast is low and has no distinguishing feature, the bushes and huts being only a few feet above the land.

This uninteresting seaboard becomes even more dreary at low water, when the mud and sand flats uncover for miles; outside of which again is shallow water with 3, 4, and 5 fathoms, and again greater depths of 10 to 15 fathoms. Ships should not, however, approach this part of the coast in less than 10 fathoms, for the currents are very strong.

Quang-wa is about 26 miles N.N.E. ½ E. from the Wanckan hut. Between is the small village of Mon-kiang, which has a river or outlet of a mountain stream, called Mon-kiang or Ponckan, the mouth of which is closed by a bar of sand; also the villages of Balian and Sei-kiang, behind the former of which are two sand hills 80 feet high.

The country at the back appeared to be cultivated, but as many sand hills were observed, and the coasting villages are inhabited by very poor people, existing chiefly on shell fish, the produce must be of a limited kind.

Several junks were seen along the coast, which at low water were high and dry on the flats. These flats, dry at low water, extend from 1 to 3 miles from high-water mark. There is a depth of about 5 fathoms at a mile outside them.

At Quang-wa there is an inlet in the flats at low water where junks lie with apparent safety, but as the N.E. monsoon sends a considerable sea down this coast, it cannot be safe at that time.

* This channel was formerly known to navigators as the Formosa channel, that between the Pescadores and China being called the Pescadores channel. On the later Admiralty charts the main body of water between China and Formosa is now called Formosa strait, and the narrow channel between the Pescadores islands and Formosa, the Pescadores channel.

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QUANG-WA to LO-KIANG is a distance of about 10 miles; the coast between them still continues low, and the mud and sand flats uncover at low water a greater distance from the land than at any other part of the coast north of Wanckan, and are bolder of approach. East 8 miles from Lo-kiang is a peak 701 feet high, and between them is a sand hill.

To the westward of the town of Lo-kiang, and distant a little more than 4 miles, is a small outlet marked by two bamboo beacons; in this creek a great number of junks find anchorage and shelter, but most of them ground at low water; they communicate with Lo-kiang (which is a large straggling town) by boats and land.

LO-KIANG to GOCHÉ.—From Lo-kiang the coast trends N.N.E., with extensive mud and sand flats uncovering at low water, 4 to 2 miles from the shore; but having passed the village of Goché 13 miles to the northward deeper water will be found nearer the shore, and the flats uncover only for a distance of from half diminishing to a quarter of a mile.

The plains and level land about Lo-kiang and to the northward are densely inhabited by a thriving people, who, by the export of rice, &c., apparently give ample employment to the numerous junks which trade between the Fu-kyen province of China and this coast; but the Chinese who inhabit the villages to the southward of Lo-kiang are wretchedly poor, and seem to live entirely on shell fish.

GOCHÉ is situated at the northern extremity of the great alluvial plain which extends as far southward as Tai-wan fu, a distance of 80 miles.

When approaching this low coast a vessel ought not to stand in within 5 or 6 miles of the shore; consequently, land will be seldom visible except at sunrise, when the bold outline of the central range of Formosa will be seen from a great distance, the highest peak of which, mount Morrison, is 12,800 feet above the sea; this mountain is in latitude 23° 27′ 15″ N.; longitude (assumed) 120° 58′ E. The general height of the mountain range varies from 9,000 to 12,000 feet, and at its north extreme is a remarkable hat-shaped peak of 11,300 feet, to which the name of Mount Sylvia has been given. Dense forests cover the whole, and where the lesser ranges, with spurs, approach the coast about Goché and to the northward, the plains are so abundantly watered with streams that little or no difficulty is experienced in producing rich crops of rice, maize, sweet potatoes, &c.

About 5 miles south of Goché commences the first range of hills, running parallel to the coast at 3 miles distance, and the ridge which in general is quite barren, and 850 feet high, east of Goché, becomes one of the spurs of the higher ranges to the northward.

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TIDES.—It is high water, full and change, at the Wanckan at 9h. 45m., springs rise 10 to 12 feet; and at Tongsiau 10h. 0m., rise 8 to 10 feet.

DIRECTIONS.—Off Wanckan and as far as Goché, a distance of 50 miles, the soundings off the low coast being shallow and irregular, ships should not stand in to a depth of less than 10 fathoms; and the strong tides which run round the Wanckan banks and reefs should also be borne in mind. From about 3 miles north of Goché to Tongsiau the coast can be approached to a mile, when soundings of not less than 10 and 12 fathoms will be found. The tides along this coast are less strong than off Wanckan.

TYKA or TAI-KIA is the principal town of the first hilly district north of the plain. It is comparatively large, with a well built wall surrounding it, and stands 3 miles from the sea on the banks of the Tyan-kiang, a small stream, the entrance of which, with a village of the same name on its south side, is 8 miles northward of Goché. Here the water is very shoal, with only 3 feet for the distance of a quarter of a mile, but it deepens to 10 fathoms at half a mile from the beach. The entrance is marked by beacons.

Tyka stands between two detached hills northward of the Goché range, and which are described as the most striking features of the coast; the southern hill, Stone peak, is 501 feet high; the northern is a remarkable square topped hill, 743 feet high, seen from the sea in all directions.

TONG-SIAU.—The Mow-lung-sui, a considerable stream, on which, a mile above its entrance, is the large village of Tong-siau, is 8 miles north-eastward of the Tyan-kiang. Between the two is a plain, at the back of which, and 7 miles inland, a rocky-topped range rises to the height of 2,227 feet, from which a long ridge stretches down to the sea, terminating in a hill 236 feet high, a mile south of the entrance of the Mow-lung-sui.

One mile north-east of the entrance, and about half a mile inland, is Single peak,* a remarkable, round, isolated hill, 239 feet high, overlooking a picturesque valley through which the Mow-lung-sui winds, passing several villages. This stream has, at high water, an entrance capable of allowing junks to enter easily. On the north side of the entrance is a large bamboo plantation.

Mount Sylvia, before mentioned, is E. ¼ S. 35 miles from Tong-siau, and 15 miles nearer in the same direction is mount Royalist, 9,000 feet high,

* Here Lieutenant Gordon's survey of the north-west coast, in 1850, terminated, and that of Commander E. Brooker, southward in 1867, commenced.

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the north-western angle of the same high range overlooking the northern plains. Petroleum springs have been discovered* 15 or 20 miles inland, a few miles beyond the first flat-topped ridge.

TON-SIAU to PORT HEONG-SAN.—Three miles north-east of Single peak is the highest part of a low coast range, 400 feet high, which extends 7 or 8 miles from Tong-siau, whence the coast falls back one mile to the entrance of another stream called the Oulan, which is apparently barred with sand-banks skirted by reefs. Lieutenant Gordon's description is as follows: "This part of the coast appears shoal. With the exception of the ridges, the land in the neighbourhood is low, the hills are all sandy and show little vegetation. A range of hills," (probably that extending north-eastward of Tong-siau) "having a low but remarkable peak† at the point, forms the southern part of the bay, off which it is shoal; from thence the coast range extends about 5 miles. The coast appeared to be steep-to, but as in other places along it, the holding ground is bad."

Northward of the Oulan river is a low serrated sandy ridge, with low projecting sandy point on which is a large fishing village. This village point, off which the water is deep well in, is the southern termination of a bay 9 miles in extent. At the southern corner of the bay is the Cheung-kong, a barred creek inside of which numerous junks are seen, and to the eastward about a mile inland, a town of the same name.‡ There is a sunken reef northward of this creek, and also a reef extending from the centre of the bay, 3 miles farther north-eastward.

PORT HEONG-SAN lying at the northern part of the above bay is available for vessels of light draught, and affords room for several large junks. The harbour is formed by a sand spit which extends 1½ miles in a southward direction from the north point of the bay, but whether above high water or not is not known. The spit encloses a shallow basin, into the head of which flows a small stream communicating with Teuk-cham, a large walled town 5 miles to the north-east, where resides the chief mandarin of the Tam-sui prefecture. This is the second city of Formosa.

* By Mr. Dodd, merchant, resident at Tamsui. These springs lie in a district peopled by the aborigines.

† By this is probably meant, not Single peak, but the northernmost hill of the coast range that extends north-eastward from Single peak, and off which, according to the original chart, shoal water, with outlying reefs, extends nearly three-quarters of a mile.

‡ The names of the rivers and towns between the latitudes of 24° 37′ N. and 24° 47′ N. have been altered on the authority of Mr. John F. Barns, Second Master, R.N., who first visited the coast on a cruize in H.M.S. *Havoc* in 1867, and afterwards travelled overland the same distance.

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Three quarters of a mile east of the end of the spit is a large reef extending northward from a projecting point of the shore, and between them the depth is 9 feet mid-channel, and 13 feet nearer the spit. The head of the bay has not been sounded. With the end of the spit bearing North, and half way between it and a sand bluff to the southward is anchorage in 4 fathoms at low water; smaller craft can go in further and anchor in 12 feet, with the spit point West, but the holding ground is bad and the anchorage open to the north-west.

TABLE HILL or Hong-san-ki, 360 feet high, and 7¼ miles N.N.E. ½ E. from port Teuk-cham or Heong-san, is a conspicuous object on the low coast which fronts the plain which extends as far northward as the hills south of Tam-sui.

From a position off this hill the elevated land about Tam-sui shows over the low land as three hills, and in fine weather the high ranges about mount Sylvia in the centre of the island, will be seen to the south-east. Along this part of the coast, as to the northward, are numerous creeks and reefs extending a short distance off, and the bottom is dark sand not fit for anchoring on. South of Table hill reefs extend nearly half a mile off shore, and there is a barred river, the Houng-mo-keng, in which several junks have been seen lying.

PAKSA POINT.—From Table hill the coast runs N.N.E. ½ E. 10 miles to Paksa-tien, an elevated sand hill which stands at the extremity of this, the north-west point of Formosa. The point is not bold; shoal water extends 1½ or 2 miles northward of it, which has been observed to break at 1¼ miles off shore.

From Paksa to Tam-sui harbour, a distance of 22 miles, the coast line curves in an east-north-east direction; the first 14 miles being low with sand hills, and along this part reefs project about half a mile off shore, with soundings of 7 fathoms well clear of them, and there are numerous creeks in some of which junks are seen lying. The low land is succeeded by table land about 600 feet high and steep-to, until within 2 miles of Tam-sui.

DIRECTIONS.—As far as Lieutenant Gordon was enabled to examine the north-west coast of Formosa, it was his opinion that a great advantage would be obtained, if, instead of hugging the coast of China or beating up in the middle of Formosa strait during the N.E. monsoon, sailing vessels were to reach well over, and at all events during the day stand close in to the Formosa shore (page 42), particularly on the ebb tide. The latter stream was always found setting strong to the N.E., whereas the flood ran very weak to the S.S.W., the former having the advantage over the latter of at least 8 miles every 24 hours. It was also observed,

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when standing across to the westward, that there was no southerly set until the middle of the strait was passed, and though the *Royalist* experienced a continuation of severe weather for several days, during which time she generally stood off and on under easy sail, she generally weathered and was always to windward of her reckoning.*

The time of high water, full and change, on the north-west coast of Formosa is at noon. The bottom is dark sand, with, occasionally, shells and broken stones; soundings of 30 to 40 fathoms near the shore, and 25 to 17 fathoms at 10 to 20 miles off. The water commences shoaling about 1½ or 2 miles off shore, and the depths decrease rapidly. The sea near the coast in moderate weather is smooth, the wind blowing along the land.

TAM-SUI HARBOUR.†—The Tam-sui river, the lower reach of which is commonly called Tam-sui harbour, flows through a valley lying south of the high northernmost range of Formosa, a spur of which rises over the harbour to the height of 2,800 feet. South of the river entrance is a remarkable double hill, the north peak of which is 2,014 feet above the sea. The river has a funnel-shaped entrance, where is the bar, and the shores of which are low, with sand hills, bordered on the south side by sand and mud flats, and on the north by a stony flat, on which is a small Chinese beacon painted black.

The bar is rather over a mile in extent; the fairway channel over it is direct, 1 to 2 cables in width, and has a depth of 7 to 8 feet at low-water springs. The river within is three-quarters of a mile broad, but the south side is filled with mud banks. The deep water channel is only a cable wide between the banks off the low points of entrance and within preserves the same breadth along the north shore for the distance of 1½ miles with 8 to 15 feet water. The entrance beacon is on the north point of entrance; and the old Dutch red fort, which is the British consulate, is half a mile higher up on the same side close to this is the custom house, and above, the town of Hoo-wei. Foreigners have not unfrequently been insulted in this town, the lower classes of which are lawless and turbulent.

Five miles above Hoo-wei the main branch of the Tam-sui river runs to the south-east on the right bank of which, about 13 miles from the entrance, is the town of Mang-kia or Bang-ka, the largest in the north of Formosa. About 5 miles above Mang-kia, a smaller branch enters from the southward, and numerous other tributary streams feed this river, which is said to take its rise 70 or 80 miles above Tam-sui harbour, and wind its course among the high mountain ranges of the interior.

* *See* also pages 244, 294, where the currents of this coast are more fully described.

† *See* Admiralty Chart of Harbours in Formosa, No. 2,376, on which is Plan of Tam-sui harbour; scale, *m* = 4 inches.

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A confluent branch takes a turn at Kang-tow, 6 miles from the entrance, and after several small rapids ends a few miles from Kelung.

Produce, Trade.—The level tracts of rich soil which extend to the foot of the mountains are well cultivated, affording abundant crops of rice, maize, sugar, indigo, tea, &c. The exports of Tamsui and Kelung consist chiefly of tea, rice, camphor, and coal, amounting, in 1881, to 661,992*l.*; the imports, of cotton and woollen goods, metals and opium, amounting to 476,730*l.* The trade is almost exclusively confined to the Chinese treaty ports. The total number of vessels entered and cleared was 273, of which 229 were British; representing a total tonnage of 117,160 tons.

The extensive coal mines of Kelung would, with a better system of working, produce an excellent and cheap supply of coal, but much requires to be done to develop the resources of an island, which is believed to be rich in minerals and natural produce. "Concerning the output of the mines, it is worthy of note that great progress has been made during the last two or three years. In the year 1878 the total amount raised was 14,029 tons; this was more than doubled during the year 1879, the total shown for that year being 30,046 tons. A very large increase upon this last amount was shown by the last year's working; and for the first half-year of 1881 we are informed that nearly 30,000 tons have been brought to the surface.

In 1881 there were fifty-one British vessels which loaded with coal at Kelung, while in 1880 the number was only thirty-six."*

The Kelung coal, however, though exceedingly cheap (about 2½ dollars per ton), is of inferior quality.

The increased production of teas seems likely to advance the commercial importance of Tam-sui.

A large trade is carried on in junks with the Fu-kyen province of China, and one or two steamers leave weekly for Amoy with Tea.

Supplies.—Good water and provisions of all kinds are to be obtained; bullocks, pigs, goats, poultry, vegetables, and fruit in profusion. Water is brought off in sanpans at 1½ dollars the ton.

Climate.—From the latter part of November to the few first days in May is the rainy season at Tam-sui. The dampness of the air makes it unpleasantly cold, although the thermometer shows a high figure as compared with the same latitude on the coast of China. It is well known that the season of the N.E. monsoon is one of continued and almost cloudless sunshine on that coast from Fuchau to Canton, and which is probably owing in some measure to the rainfall of Formosa. There cannot

* Extracted from an article in the Hong Kong "*China Mail*," dated 8th September, 1881.

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be much doubt that the constant rain in north Formosa is due to its propinquity to the Japan stream, over whose heated waters the north-east wind blows, and with its surcharge of moisture coming in contact with the lofty mountain ranges, is forced to precipitate on the island, and 12 miles west to the seaward.† The heat of summer is tropical. Tam-sui is sometimes visited by violent storms ; rarely by typhoons.

Tides.—It is high water, full and change, in Tam-sui harbour at 11h. 45m., springs rise 7 to 10 feet.

In September 1867, H.M.S. *Sylvia* experienced when outside the port, about 3 miles off the coast, a strong ebb stream setting to the north-eastward, at the rate of 2½ or 3 miles an hour. This stream runs round the north point of Formosa, and creates a turbulent ripple off Foki point. *See* tides, page 245.

The flood stream runs to the south-westward, past the port of Tam-sui, at the rate of 2 miles an hour; both flood and ebb streams take a direct course over the bar, and in the river.

From observations made in H.M.S. *Royalist* when at anchor off the harbour, October 1847, five days before full and change, the flood set S.S.W. 1½ knots at its strength, and 3½ knots the whole tide; and the ebb ran to the N.E. 3 knots at its strength, and 7 miles the whole tide. The flood appeared to run about 4 hours, the ebb 8 hours. As the ebb sets along shore to the north, and has the advantage of 4 miles in the twelve hours, and more during springs, it will greatly assist a vessel when beating to windward during the N.E. monsoon.

Entrance Beacon and Leading Mark.—The Entrance beacon on the north bank, W. ½ N. 1,030 yards from the Red fort, is 49 feet high, and pyramid shaped, consisting of four poles surmounted by a wicker cage ; the whole painted *white*. The beacon in line with the Red fort or Custom House flagstaff form a leading mark for entering Tam-sui harbour, subject to changes in the Bar channel. The deepest water lies between these marks in an E. by S. line from the iron entrance buoy, until the Chinese beacon bears N. ¾ W. ; and the same course may be continued until abreast of the British consular buildings.†

Buoys.—1. The North bar buoy, black and conical, is moored in five fathoms water, and marks the northern approach to the Tamsui bar channel.

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* Abbreviated from " *Treaty Ports of China*," p. 316.

† *See* Admiralty Chart of Harbours in Formosa, No. 2,376, on which is Plan of Tam-sui harbour ; scale, *m* = 4 inches ; and Chinese Official List, corrected to December 1883.

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2. The Southern bar buoy, *red* and conical, is moored in twenty-eight feet of water, and marks the southern approach to the Tamsui bar channel.

3. The Harbour buoy. A *red* nun buoy moored in seven feet of water. It marks the northern edge of the mud bank in Tamsui harbour.*

DIRECTIONS.—If approaching Tam-sui from the westward, steer midway between the two mountains, one of which rises on either side the entrance, until the leading marks to cross the bar are discerned, but as the channel across the bar is liable to shift from the effects of freshets or gales, no vessel should enter Tam-sui for the first time without a pilot, one of whom can generally be obtained off the port.†

With reference to this harbour, Lieutenant (now Commander) W. M. Carey, writing in 1880, remarks :—" On making the land in the month of March the low land was first seen when about 7 miles distant, the hills not being visible from fog. It is very difficult for a stranger to pick up the port when only the low land is seen, unless he happens to strike the entrance of the harbour, which is very doubtful, as it is impossible to know the strength of the southerly set. About 5 miles to the northward, standing alone on the highest part of the low land, is a conspicuous tree, which is a good guide in making the port."

If intending to anchor, do not stand into less than 8 fathoms, unless in a steam vessel, for the anchorage off the harbour is unsafe, as the holding ground of loose, shifting sand is not good; and a vessel, though with a good scope of cable out, is likely to drive, even in moderate weather. When the wind freshens from the north-east, a heavy sea rolls in, breaking even in 3 fathoms water, and a sailing vessel must immediately proceed to sea, for should the wind veer to north-west it might be impracticable. In summer also it is exposed to short, sharp south-westers, which rise suddenly with little or no warning, but which are not of very common occurrence; in the event of one, it is necessary to put to sea without delay.

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* These buoys are surmounted by a ball. Berlin Notice to Mariners, August 1882.

† These pilots have not always proved trustworthy, shipmasters should therefore be on their guard and procure a licensed pilot, if possible. The charge is six dollars.

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From the Customs signal staff the following signals are shown to indicate the depth of water over the Tam-sui bar :—

Signals displayed from northern yard arm.

Depth of water in feet on Bar.	Geometrical Signal.	Depth of water in feet on Bar.	Geometrical Signal.
7 feet	△	14 feet	⊗
8 „	◇	15 „	◈
9 „	□	16 „	⊠
10 „	○	17 „	▣
11 „	⧋	18 „	⧓
12 „	⧆	19 „	⧆
13 „	⧈		

A triangle (△) at the quarter of the northern yard arm signifies half a foot.

A diamond (◇) at the southern yard arm signifies a *rising* tide.

A ball (○) at the southern yard arm signifies a *falling* tide.

The symbols are painted *white* and are 6 feet in diameter.

N.B.—Owing to the irregularity in speed of the ebb and flow of tide, *these signals are not always reliable, and caution is necessary.*

On entering the river pass the white beacon at about three-quarters of a cable, and run up along the north shore at the same distance. The anchorage for large vessels is off the custom house; the best berth for men-of-war is at about a cable eastward of the red buoy that has been laid down for use of the local steam vessels. It is necessary to moor, and ships should be prepared with a spare anchor in the winter months, as the freshets have been so strong, after continuous rain, as to cause a vessel to drift out and be wrecked on the bar. The holding ground is not very good. Of the advantages of this harbour, it may be said that it is quite secure from all storms; and although there is only a depth of 8 feet over the bar, yet, the rise being from 7 to 10 feet, vessels of moderate draught may enter or leave daily throughout the year.

NORTH COAST of FORMOSA. — The north end of Formosa is high and mountainous, except the north and nort-west points, which are low, and have reefs extending a considerable distance off; here the Tam-sui range rises to the height of 2,800 feet above the sea, and is generally covered with clouds. In the neighbourhood of, and eastward of

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Ke-lung harbour, the coast hills are wedge shaped, nearly all perpendicular to the north-west, and sloping eastward.

From Tam-sui the coast trends to the north-east, 10 miles to Syau-ki point, and then 4 miles east to Foki point; a reef fronts it, and in some places extends nearly half a mile off shore. The shore rises gradually, and is very flat for several miles inland to the Tam-sui range. The north part is of moderate height, nearly perpendicular, and sloping both to the east and west. The ebb or north-eastern stream often causes a great tide race off Syau-ki point, *see* page 245.

Foki point is very low, and has a dangerous shoal extending about a mile from it, and then trends round to the westward, bordering the 3 miles of coast which forms the northern extreme of Formosa. It will be prudent to give the point a wide berth, as the *Royalist* shoaled suddenly from 60 to 30 fathoms, and there were breakers close to leeward of her.

Masou Peninsula is 8 miles S.E. of Foki point. Its north-west point is formed by a remarkable hill of sandstone, 250 feet high, perpendicular to the north-west.

To the westward of this peninsula is the deep bay and valley of Masou, in the middle of which is an islet with three rocks lying S.E. of it, two of which are covered at low tide, the other always shows. Between Masou and Foki point the coast appears bold.

Immediately eastward of Masou peninsula is a bay 3 miles across, with numerous reefs running off the points within it; and 2 miles farther on the entrance of Ke-lung harbour.

KE-LUNG ISLAND.—The north end of Formosa, between Foki and Petou points 20 miles apart, forms somewhat of a bay into which the N.E. monsoon rolls a heavy sea; in this bay about 6 miles eastward of Masou peninsula is Ke-lung island, a remarkable black rocky island rising precipitously on all sides to the height of 580 feet, with rather a flat summit. This excellent landmark guides to Ke-lung harbour, the entrance to which bears from it S.W. 2½ miles. At a cable from its north-west side is a conical rock 100 feet high, and extending S.W. by S., from the island is a spit of gravel or rock, a mile in length, over which there is usually a heavy tide race. Image point just open of Bush island, S.W. by W. ¼ W. leads well clear. The other parts of the island are steep-to, and there are no other dangers between the spit and the shore, the depth being 30 fathoms.

AUDACIOUS ROCK, a small pinnacle, on which H.M.S. *Audacious* struck in 1876; has 21 feet over it, and 10 fathoms at the

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distance of 50 yards in all directions. From the shoalest part, the islet, (100 feet high,) adjacent to the west side of Ke-lung bears E. $\frac{3}{4}$ S., distant $1\frac{7}{10}$ miles; and the second peak west of Image point (293 feet high), S. by W. $\frac{1}{4}$ W., distant $2\frac{1}{2}$ miles.

Clearing Marks.—Petou point, just overlapping the south point of Ke-lung island, bearing S.E. by E. $\frac{1}{2}$ E., leads about 2 cables north-eastward of Audacious rock. The summit of the distant range of hills (southward of Ke-lung town) in line with the Saddle between the first and second peaks west of Image point, bearing S. $\frac{1}{4}$ W., leads about 2 cables westward of Audacious rock in 15 fathoms water.

KE-LUNG HARBOUR* is easy of access and well sheltered in all winds, except those from the northward, which send in a heavy sea. Ke-lung island directs to the entrance which is marked by a beacon, and the hidden dangers within are marked by buoys.

The country in the vicinity of the harbour is richly wooded to the water's edge, and the land rises in a succession of picturesque knolls and undulating hills, fantastically piled one above the other, and backed by a range of lofty mountains. Few dwellings or signs of cultivation are visible, but the brilliancy of the verdure and luxuriance of the vegetation render the *coup d'œil* most striking, a perfect contrast to the sterile-looking mainland of China.

Palm island, three-quarters of a mile long, east and west, is 2 miles S.S.W. $\frac{1}{2}$ W. from Ke-lung island. The land over its northern coast is 200 feet above the sea. Close to its north-west extreme, and almost connected with it, is Macedonian mound, 140 feet high. Both the island and the mound are fringed with steep shelving rocks having 7 and 10 fathoms close to. Palm island is separated from the main by a very narrow channel available only for boats and junks, and which has a rock at its narrowest part.

Bush island, low and rocky, about 10 feet high and covered with shrubs, lies 3 cables west of Palm island. Its extreme west end is marked by a beacon, officially described as "grating mounted on a single spar 42 feet high, the sea face of the boards painted white—the spar painted *black*," this beacon is easily recognised.

Image point, the west point of entrance to the harbour, is a low projecting shelf half a mile W.S.W. of Bush island, and remarkable from the number of detached pieces of sandstone rock which the action of the sea has worn into grotesque figures; the summit over it, 390 feet high, has several patches of stratified cliff on its seaward slope. The point may

* *See* Admiralty Chart of Ke-lung harbour, No. 2,618; scale, $m = 5$ inches.

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be rounded at a cable. There are 7 to 16 fathoms in the entrance, which is 4 cables wide, between Image point and the reef off Bush island.

Inflexible reef, on which several ships have struck, is a sunken ledge of rocks of 1 to 3 fathoms, covered with coral, and nearly 2 cables in extent. On its outer edge are two knolls of 4 and 6 feet, from the westernmost of which Image point bears N.W. by W. 4 cables, and the left extreme of Bush island N. by E. This knoll is marked by a *black* nun buoy surmounted by a spherical cage, on its western edge, in 11 fathoms.

Crag peak and Ruin rock.—Crag peak, a remarkable sugar loaf hill, about 150 feet high, lies on the western shore of the harbour, half a mile southward of Image point. From it projects another shelf of sandstone, on which is the mushroom-shaped rock to which has been given the name of Ruin rock. A sunken ledge with 3 to 9 feet on it extends $1\frac{1}{2}$ cables eastward of this point, the outer edge of which is marked by a *red* nun buoy surmounted by a *black* spherical cage (Coral shoal buoy), moored in 5 fathoms.

Junk harbour.*—Above Ruin rock the harbour turns south-westward to its head, gradually shoaling to one fathom at the distance of half a mile. There is room for one vessel of moderate size to lie at single anchor with short scope, in 4 to 6 fathoms, S E. by E. of Ruin rock, but a larger vessel must moor. During the N.E. monsoon, when Junk harbour is generally full of small vessels, good shelter will be found southward of Inflexible reef, with Bush island beacon bearing North. The junks anchor in 2 and $2\frac{1}{2}$ fathoms at a quarter of a mile higher up and about a mile from the town of Ke-lung, which can only be approached by boats at high water.

The head of the harbour has shoaled considerably of late years and much less water will be found than is shown on the chart; this is due in some measure to the numerous junks which frequent the port, being allowed to throw overboard their ballast.

The town of Ke-lung stands at the head of the bay a mile above Ruin rock, and is joined to the suburb of Sow-wan on the south side of the harbour, by a stone causeway. The coal mines are about a mile E.S.E. of the town, on the southern banks of the small shallow stream which branches off in that direction.

Supplies.—The trade of Ke-lung is extensive, principally with the river Min, Chin-chu, Amoy, and Tongsang. For the latter place quantities

* Junk harbour is said to have shoaled about 3 feet since the last survey.—Nav. Lieut. Balliston, H.M.S. *Vigilant*, 1875.

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of coal are shipped, and for the former rice, ground-nut oil, camphor, and camphor wood.

Good water is easily obtained on the western shore of the harbour, in the second small bay within Crag peak. There are several streams on either shore. Pigs, poultry, and sweet potatoes may be purchased; at Sow-wan there is a market-place.

The Ke-lung coal is a small bituminous mineral, good for domestic purposes and for steamers making short passages, but it is otherwise unsuitable; it burns rapidly, cakes the furnace, and makes much smoke, choking the tubes. The consumption is about one half greater than Welsh coal, and its evaporating power 30 per cent. less, whilst a loss of speed is caused by the frequent necessity of sweeping tubes. Vessels loading with coal had formerly to clear at Tam-sui, but a branch of the custom house has now been established at this port to obviate that inconvenience. The amount of coal exported from Ke-lung and Tam-sui in foreign vessels during the year 1881, as reported to the Imperial Maritime Customs, was 46,178 tons. In 1880 the amount so reported was 24,654 tons, and there was consequently an increase of 21,524 tons in the export of 1881 as compared with that of the year before.*

Climate.—The N.E. monsoon is generally attended with rain. The summer is fine, but black north-easters with rain are liable to occur; they send a considerable swell into the harbour but do not often fetch home, and at the same time it is nearly calm at the head of the inlet. When they do blow home, they send in a heavy sea, and the wreck of junks is not uncommon, and European vessels part their cables at such times. Typhoons are of rare occurrence.

TIDES.—It is high water, full and change, in Ke-lung harbour at 10h. 30m., and the rise, when uninfluenced by the weather, is about 3 feet. The flood at the entrance sets fairly into the harbour about a knot an hour; the ebb towards the eastern shore and rocks off Bush islet. In the narrows of Junk passage, between Palm island and the main, the streams run with great strength. Outside the harbour the flood sets into the bight towards Mason peninsula and is weak; the current during the ebb sets strong to the eastward, and only occasionally changes its direction to the north-westward during the flood.†

DIRECTIONS.—The entrance of Ke-lung may be boldly steered for even in a N.E. gale with thick weather, if the land about it, especially Ke-lung island, can be well made out, care being taken to avoid the

* Report of H.M. Consul at Tam-sui, 1882.

† Between Ke-lung and Craig island, in May, a strong current, perhaps the flood tide, has been observed setting S.W. 2 miles an hour.

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Audacious rock (described on page 297). Crag peak, a conspicuous landmark within the harbour, may be steered for on a S. by W. ¼ W. bearing, and will lead in within the entrance clear of all danger. After passing Image point which it is preferable to hug, steer for the sandy bay to the south-east, getting the point on a N.W. ½ N. bearing, and anchor in 6 to 7 fathoms, mud, good holding ground, with the west extreme of Bush island, N. by E., or Crag peak S.W. ¼ W. This anchorage is 1½ cables south of Inflexible reef, and if the buoys are in position the *red* buoy will bear north.

If proceeding into Junk harbour, round Ruin rock at 2 cables, passing outside the *white* buoy, and anchor with the rock S.E. by E. ½ E. A gun boat may proceed higher up.

A sailing vessel must use much caution in leaving this harbour during the N.E. monsoon, in consequence of the heavy sea rolling in, and there being no anchorage outside. With a light wind short tacks should be made, and the entrance kept open until an offing is gained.

COAL HARBOUR, or Petaou bay, a small inlet of the coast 1¼ miles south-eastward of Palm island at the entrance of Ke-lung and bearing from Ke-lung island S. ½ E., is so called from its proximity to the coal mines on the hill sides of the southern shore of Quar-see-kau bay. It lies open to the northward and is surrounded with reefs and rocks, and shoal at the head; it might, however, be available to a vessel in distress, if embayed to windward of it.

It offers anchorage and shelter for one or two vessels only, and should the mines ever be worked by Europeans, the coal could be conveyed to Harbour rock at its head by means of a railroad along the west shore of the bay, at the base of the hills. A short pier from the north side of the rock would enable a vessel to lie alongside, in 3 or 4 fathoms water, and receive or discharge her cargo.

ISLANDS NORTH-EAST OF FORMOSA.

From the northern extremity of Formosa there extends for 170 miles in an E. by N. direction, a chain of rocks and islands of small size, bold of approach, and for the most part widely separated, lying on or near the edge of the bank of soundings extending from the coast of China. About them are irregular depths of 60 to 100 fathoms, and they appear to be separated by deep water, yet unsounded, both from the Luchu islands to the eastward, and from the Meiaco sima chain lying 60 to 80 miles in a parallel line to the southward.*

* *See* Admiralty Chart of the islands between Formosa and Japan, with the adjacent coast of China, No. 2,412; scale, $d = 3{\cdot}0$ inches.

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This chain comprises a group of three, Pinnacle, Craig, and Agincourt islands, 20 to 30 miles from Formosa, a second group, some 80 miles eastward, consisting of Hoa-pin su, the Pinnacles and Ti-a-usu; and 50 miles beyond, the Raleigh rock, which is the easternmost of the chain. These all lie in the strength of the Japan current, although the first-named group is within the inflence of the tidal streams, but unlike the Meiaco simas, they have no coral formations.

PINNACLE ISLAND, called by the Chinese Tsaou su or the Chairbearer, owing to its resemblance to coolies carrying a sedan chair, bears N.E. by N. 19 miles from the entrance of Ke-lung harbour. It is a rugged mass of rock, 170 feet high, with perpendicular sides, and around it are three semi-detached pinnacle rocks about half the height of the island, two of which are visible in almost every direction. They all stand upon a low reef, the western point of which extends, probably, 2 cables.

CRAIG ISLAND, is 10 miles E.N.E. of Pinnacle island. Its eastern point is a steep cliff from the summit of the island, 240 feet in height, off which lie the two high craggy rocks, surrounded by a large reef, from which the island has probably received its name. The southern face is cliff-bound and steep, with a sandy bay on the west formed by the western point, a flat conical head with a low cliff. The northern face of the island is a gradual but broken slope, off which H.M.S. *Serpent* anchored in 9 fathoms, in June 1866. At this season the island is visited by a species of tern similar to the wide-awakes of the island of Ascension in the South Atlantic.

AGINCOURT ISLAND, 9 miles N. ¾ W. from Craig island, is in lat. 25° 38′ N., long. 122° 5½′ E. It has a round summit, 540 feet high, stretching out into high, bold headlands on the north and south, in the latter of which is an immense cavern. All the eastern face is very steep; the western is less so, and has a high, stony beach where stands a small village; and off the south-west point is a reef. Soundings of 20 to 45 fathoms were obtained around the island, within a mile, the western side being the shallower.*

HOA-PIN SU and the PINNACLE GROUP.—Hoa-pin su, the north face† of which is in lat. 25° 47′ N., long. 123° 30′ E.,

* The above positions differ a little from those previously given. These islands were examined in June 1866 by Commander Bullock of H.M.S. *Serpent*, and their positions, as well as the height of Agincourt island, accurately determined.

† The above description of this group is from Captain Sir Edward Belcher's *Voyage of H.M.S. Samarang*, 1843 to 1846.

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is an island 3 miles in extent. "The extreme height of Hoa-pin su was found to be 1,181 feet, the island being apparently cut away vertically at this elevation, on the southern side, in a W.N.W. direction;* the remaining portion sloping to the eastward, where the inclination furnished copious rills of excellent water. That this supply is not casual is proved by the existence of fresh-water fish found in most of the natural cisterns, which are connected almost to the sea, and abound in weeds which shelter them. There are no traces of inhabitants, indeed the soil is insufficient for the maintenance of half a dozen persons."

The Pinnacle group, which is connected by a reef and bank of soundings with Hoa-pin su, allowing a channel of about 12 fathoms water between it and the Channel rock, presents the appearance of an upheaved and subsequently ruptured mass of compact grey columnar basalt, rising suddenly into needle-shaped pinnacles, which are apparently ready for disintegration by the first disturbing cause, either gales of wind or earthquake. On the summits of some of the flat rocks long grass was found, but no shrubs or trees. The rocks were everywhere whitened by the dung of marine birds.

This group is of triangular form extending 6 miles eastward of Hoa-pin su, and within this space are several reefs; and although a safe channel exists between Hoa-pin su and the Pinnacle islands, it ought not (on account of the strength of the tides destroying the steerage), to be attempted by sailing vessels if it can be avoided. This is also very deceitful, and the slightest deviation of the course, which would change the current from the weather to the lee bow, would also most materially change the rate of sailing, particularly under the variables which prevail here; and from the reliance on what would be deemed a commanding breeze, the vessel would suddenly be found unmanageable.

These islands lie in the Japan stream, which in the S.W. monsoon flows steadily to the north-east at from 1 to 1½ knots per hour, and in the N.E. monsoon, at about the same rate, but in a direction generally more to the eastward, and sometimes even south-eastward.

TI-A-USU (or more probably Tiaou su), N.E. northerly, 15 miles from Hoa-pin su, appears to be composed of huge boulders of a greenish porphyritic stone. It is about 1½ or two miles in extent, and of irregular outline, bordered for the most part by a low dark cliff, with rocks off its

* The south side is probably so scarped, but cannot be in a W.N.W. direction, for the south-west point, when seen on a S.E. by E. bearing, appears low and shelving. The western part of the island rises symmetrically to a sharp peak, and is separated by a deep gap from the eastern peak which is somewhat lower, very rugged, and steep on its southern side; the south-east point is a high cliff. The island might rather, therefore, be said to slope to the north-west.—Captain Chas. J. Bullock, R.N.

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points. The summit is a round hill about 600 feet high, with a lower hill of similar shape on its north-east side, which both show very prominently when the island is first made from the eastward. The island is covered with low brushwood dotted with stunted trees, which have much increased since the time of Captain Belcher's visit.

RALEIGH ROCK, in lat. 25° 55′ N., long. 124° 35′ E., and 50 miles E. ¾. S., from Ti-a-usu, is a narrow, elongated mass of bare rock, rising abruptly from a reef to the height of 270 feet, and perpendicular on all sides. Its length is two cables, and its breadth, exclusive of the reef, half a cable. Its summit slopes, not quite evenly, from its eastern and highest part towards the west, with a small conical rise at the centre. Reefs stretch off its west, east, and north sides, the first extending 2 cables under water, and on the north reef stands a pinnacle rock, 100 feet in height. In clear weather Raleigh rock is visible 20 miles, and, when seen from east or west, makes like a square mass of rock rounded off at the top, with a detached pinnacle rock close to its north side. In the distance, on these bearings, it appears like a junk under sail.*

SOUNDINGS.—The bank of soundings appears to terminate a little eastward of Raleigh rock, for at 12 miles N.E. by E. of it no bottom was obtained with 150 fathoms of line. In the vicinity of the islands, the depths were found very irregular, varying from 60 to 90 fathoms, over a bottom of grey sand, or rock, or stones, so that it would not be possible to determine a ship's position in thick weather by means of soundings, beyond the fact of her being on the bank.

MEIACO SIMA GROUP.

The several groups which bear this name,† form the westernmost portion of the long chain of islands which extends in an easterly and north-easterly direction from Formosa to the southern extremity of Kiusiu, Japan. They lie between the parallels of 24° 0′ and 25° 6′ N., and the meridians of 122° 55′ and 125° 30′ E., and consist of two principal groups, Tai-pin san and Pa-chung san, and the solitary island of Kumi, extending in all nearly 150 miles. The Tai-pin san or eastern group possesses neither port nor anchorage, is surrounded with dangerous coral reefs, and ought to be care-

* This rock and Recruit island, reported in 1861, are identical.

† *See* Admiralty chart of the Meiaco sima group, No. 2,105; scale, $m = 0{\cdot}5$ of an inch. Sometimes written Majico sima, the pronunciation of which (the *j* being silent) is almost the same. The description of this group is from the surveys and writings of Captain Sir E. Belcher, R.N., H.M.S. *Samarang*.

For winds and weather, *see* page 6.

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fully avoided. The western group consists of two large mountainous islands, Pa-chung san and Ku-kien san, and eight small ones, three of which only are elevated, the remainder being flat like the coral islands of the Pacific, and similarly belted with reefs. All the islands on the south side of this group are connected under water by coral, and what passages there exist between them are unexplored and unsafe, being studded with numerous patches and knolls; to approach the group from the south would be dangerous in the extreme, and the only accessible port there known is Broughton bay, at the south-east port of Pa-chung san. The northern coasts are bolder, and on that side there is a broad and safe approach, between the two large islands, to port Haddington on the west side of Pa-chung san, where a distressed vessel may secure supplies of wood, water, and provisions. The Meiaco simas also include the isolated island of Kumi, 40 miles to the westward.* The whole group is clothed with vegetation, the soil is good, and horses and cattle are in abundance; the people however are not enterprising, and are subject to the chief of the Lu-chu group.

KUMI ISLAND,† conspicuous by the peculiar sharpness of its single peak, 770 feet high, and table base, is 60 miles E. by S. of Sau-o bay, Formosa. The island is 6 miles long, east and west, and its peak is at the south-eastern part; it is composed of coralline limestone, all its ranges are capped with trees and brushwood, but excepting the pine fir, which contains a great portion of resin, none attain any size. There are four villages on the island, one on the west, and two on the north side, one of which is inland, in a basin-shaped valley. The principal town and port is on the north side, in which were several junks of about 50 tons riding at anchor; but the entrance from the sea is so narrow and shallow, that ingress and egress can only be effected at spring tides, and with very smooth water. The position of the northern beach to the west of the town is 24° 26′ N., and 122° 56′ E.

No convenient anchorage could be found, but during the interval employed in the examination in H.M.S. *Samarang*, a bank of soundings was discovered to the northward of the town, affording tolerable anchorage in fine weather, in 17 fathoms, sandy bottom, apparently over coral, at 3 cables from the shore.

CHUNG-CHI and SANDY ISLANDS are the south-western outliers of the western group of the Meiaco simas. Chung-chi, 33 miles S.E. by E. ¾ E. from Kumi peak is a high uninhabited mass of

* Reefs, reported to have been seen lying westward of Kumi, are described on page 268.

† *See* Plan of Kumi (Koumi) on Admiralty chart, No. 2,105.

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basaltic rock. Sandy or Hasyokan island, 13 miles S.E. by E. from Chung-chi, is 3 miles in extent, east and west, with a few trees and huts on it, and stands on a coral reef, which extends a mile from its south-west point. There is no safe passage between the two islands; between Chung-chi and Ku-kien san several coral patches have been observed, and Sandy island is stated to be connected with Loney island, 16 miles north-eastward, by numerous reefs and shoals.

KU-KIEN SAN and its HARBOURS.—Ku-kien san is 16 miles in extent, and rises at its highest part to an elevation of about 2,000 feet, its shores affording several commodious harbours, which, with good charts, are safe of approach. These were either examined or surveyed by Sir Edward Belcher, and though from the nature of the locality they abound in coral reefs, some of which may have escaped observation, yet with care they are accessible; and, although precise directions are not given, there are three, ports Cockburn and Herbert, and Koubah passage which are adapted for shelter for small vessels, or even those drawing 18 feet or more, where a refit might be accomplished in still water in either monsoon, or where steam vessels might lie safely for the purpose of obtaining wood; and two other open bays, Seymour bay and port Gage, well sheltered in the N.E. monsoon, and admirably adapted for watering and wooding, although these, or stress of weather, would be the only inducements to visit the island, and indeed, except at the two latter places, watering would be found very difficult, as reefs extend a great distance from the mouths of the streams. All dangers are well marked by the coral fringe which extends a greater or less distance from the island.

Seymour bay is on the southern coast, 2 miles east of Seymour point, the south-west angle of Ku-kien san. Here is perfect shelter in the N.E. monsoon, and a fine stream enters the sea in deep water, where a vessel might be moored sufficiently close to lead the hoses from the pumps into her, without the intervention of boats or casks.

Ports Cockburn and Herbert.—At the middle of the western coast is Herbert island, 700 feet high, detached from the extremity of a long peninsula, which separates two narrow inlets. Port Cockburn, on the south, carries very deep water, 30 decreasing to 20 fathoms up to its head, which is 3 miles from the entrance; but there are many coral reefs off its shores. The harbour is almost landlocked, and only open to one point, N.W. by N.

Port Herbert, north of the peninsula, is fringed by broad reefs throughout its whole extent. It has 3 fathoms in the middle of its entrance, which opens out into a broad basin within, with a depth of 22 fathoms, from whence a narrow channel, about 2 cables in width between the reefs, and

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carrying 14, 7, and 10 fathoms, leads S.E. by S., 1½ miles, to the head of the inlet, where is anchorage, clear of a coral reef, in 6 fathoms. This harbour is also nearly landlocked, and open only to N.W. by N.

Port Gage is a small bay, also on the west side of Ku-kien san, under its north point, where anchorage may be obtained in 3 to 5 fathoms, and where there is good water. The bay is about 3 cables across, and perfectly sheltered in the N.E. monsoon, but is open to West and S.W.

Isaac and Koubah Islands.—Isaac island, 40 feet high and 2 miles northward of Ku-kien san, extends with its coral belt nearly 3 miles, thus forming good shelter from all points except East, West, and N.W.; but the depth in the passage between it and the shore is not known, being greater than 10 fathoms, except at one spot in the centre of the passage, where a cast of 9 fathoms was obtained. The north shore of Ku-kien san is fringed with a broad belt of coral, in which, south of Isaac island, a small bay is formed.

Koubah island is a mile off the east point of Ku-kien san, with a passage about 2 cables broad running S. by W. between the coral banks of either shore, and carrying 14 to 10 fathoms for 3 miles from the north entrance.

PA-CHUNG SAN, 8 miles eastward of Ku-kien san, is about 10 miles in extent across the body of the island, and the hills on its north side rise to the height of 1,500 feet, from which range a narrow peninsula stretches 12 miles N.E. by N., terminating in Adams point, off which is an islet on the reef. The whole island is skirted by coral. Port Haddington, on its west side, would shelter a large fleet, but it abounds with coral patches, rising suddenly from 10 or 15 fathoms almost to the surface; in clear weather all those having as little as 5 fathoms are clearly discernible, and therefore easily avoided. South-westward of Pa-chung is Roberton island, 60 feet high, 4½ miles westward of which is Koubah island, before mentioned, the two are connected by a coral reef, which is steep-to, and on the edge of which are three islets. Roberton is also connected by reefs with Baugh, Inglefield, and Loney islands to the south-west, which also lie off Ku-kien san; and South rock, which is high and marks the edge of the reef, is S.E. of Roberton, and 3¾ miles from Pa-chung.

Between Roberton and Pa-chung is a channel abounding with coral reefs, through which H.M.S. *Lily* and *Contest* passed on their way to Broughton bay on the south side of the island, in 1852.

On the north side of Pa-chung are several good bays, where anchorage might be found in the S.W. monsoon, but which are certainly not adapted for refit.

PORT HADDINGTON is a spacious bay on the west side of Pa-chung san. Off Hamilton point, the north point of entrance, will be

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noticed a remarkable little rocky hummock, upon which was left, at the time of the survey, a very large pile of stones. The bottom for more than half a mile off the point is rocky and dangerous; but as all the dangers of this port are visible from aloft, there is no risk with a proper look out. The inner parts of this extensive port have numerous shoals, but there is still abundance of excellent anchorage without, and where the vessel will be land-locked. The *Samarang* anchored about a mile or less within Hamilton point, in 10 fathoms, clear bottom.*

This is a well sheltered port during the N.E. monsoon, but not so safe in the S.W. monsoon; for although it is land-locked, there is a long fetch for the sea with a S.W. gale, and in the latter season typhoons are said to be very violent about this region.

Supplies.—A convenient watering place was established by sinking a cask and suspending the suction hose of Hearle's pump over it, so as to prevent the sand from being sucked in. The stream from above was regulated by dams to ensure not more than a sufficient supply, by which means the water obtained was beautifully clear. Here wood is abundant, and the position is farther preferable by being so far from the villages as to prevent

* Port Haddington was visited by two naval officers in the steamer *Prince Kung*, in June 1866, but the account given by them of the anchorage is by no means so favourable as that of Sir Edward Belcher. This steamer having no masthead from which the vessel could be conned, struck a coral reef on entering; and, with much difficulty, found bad anchorage in 5 fathoms, the vessel swinging in one direction into 16 fathoms, and in another close to a coral rock with only 5 feet. Rocks were observed which were not marked on the chart, and it was considered that there would be great difficulty to sailing vessels in finding safe anchorage. Water was not easily obtained, for although many good streams ran into the harbour, they were brackish some distance up at high water, whilst at low water, the boats had to lie some distance off. The time of high water, and the rise and fall of tide, were, on this occasion, approximately obtained. The shipwrecked crew of the *Fairlight* were found lodged at a village or town (said to be the largest on the island), about 4 miles southward of Baillie head, the south-west point of the port. They had been well treated but had suffered from want of a sufficiently nourishing diet. The inhabitants were poor, but a contented and unarmed race, in appearance similar to the Loochooans to whom they are subject, but resembling the Japanese more in manner, customs, and language. Their chief lives in the interior of Pa-chung-san. They send a junk annually to Fuchow, and trade with Japan, to which they export a spirit called *mio-sake*. The southern part of the island was found very undulating and well wooded, and though not much cultivated ground was seen, for the soil is poor and rocky, yet the flat grounds and some of the slopes were covered with coarse grass which afforded pasturage to large herds of cattle. There is also a great abundance of ponies which are used as beasts of burden. On departure the chiefs refused to accept any remuneration for their care of the shipwrecked crew, and provided them with two bullocks and sufficient rice for the voyage.—From the Remark Books of Lieut. Philip E. Luard, R.N., and Mr. John F. Barns, R.N. The *Prince Kung* was chartered to convey to China the crew of the British ship *Fairlight* which had been wrecked on the south reef of Pa-chung-san.

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the authorities from feeling alarmed. Sufficient fire-wood was cut at Tamanu beach to fill the ship, and trees were obtained of pine and other woods adapted for plank.

Tides.—It is high water, full and change, at 6 h. 45 m., and the rise and fall is about 7 feet.

Directions.—From the westward, port Haddington may be sought and reached more expeditiously by working up on the north-west side of Ku-kien-san, rounding Isaac island and running down off the danger line from Melros point (the northern part of the peninsula which forms the north side of the bay) round the reef, which extends 6 cables off Hamilton point, and shoot into 15 fathoms. The chart exhibits several awkward patches, but a vessel which works decently can thread her way between them, if the sun be bright, as all the shoals may easily be traced from aloft.

There is a passage from port Haddington into Broughton bay which was used by H.M. sloops *Lily* and *Contest* in 1852; it abounds in coral reefs.

BROUGHTON BAY is on the south coast of Pa-chung san, one mile westward of Providence point, its south-east angle. The only reason for noticing it is, that a port of refuge with still water, in case of disaster may be found on this side of the island; when a disabled vessel could not beat round to the more secure harbour of port Haddington. Neither wood nor water can be procured conveniently, but, with respect to a distressed vessel, they could be obtained from the authorities who reside at this place. The bay consists of an outer anchorage in 19 fathoms at three-quarters of a mile from the shore, and an inner anchorage* at the head of the bay, into which a ship may be warped into a snug position, and moored with just enough room to swing, the depths up to the coral ledges varying from 13 to 7 fathoms.

Directions.—The only directions which will assist the seaman in finding this snug little anchorage, safe only, however, during the N.E. monsoon, are as follows: — Approaching from the westward, when Chung-chi island is made, steer so as to give the reefs off the south side of Sandy island a berth of two miles, taking care to avoid passing northward of a line joining the two islands, between which it is said there is no safe passage. Having passed Sandy island, work for the south-east angle of Pa-chung san, avoiding the reefs, the edges of which extend in a direct line between the two. The high rock named South rock will point out the outer reefs of Pa-chung. These dangers are best avoided by the eye, the

* H.M. Sloop *Lily*, in 1852, searched for the opening into Broughton bay, but could not find it.—Remark Book of Com. J. W. Spencer, R.N., H.M. Sloop *Contest*, 1852.

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shoals being visible in 5 or 6 fathoms, and breaking upon those of two and three fathoms.

The opening of the reef lies in the heart of a deep indentation just to the northward of a low point on the western side of the bay, and has apparently a centre bar; the right hand opening is the proper one.

From the eastward there are no dangers which are not clearly visible. After making the land, edge along the southern and eastern breakers until the abrupt turn of the breaker line is seen, at which moment the extreme south-west point of the bay will open. The breakers have regular soundings off them, but the course it will probably lead in 7, 8, or 9 fathoms, deepening to 14 or 15 off the inlet. As the breeze generally blows out, it will be advisable to send a boat ahead to find clear ground off the opening, and shoot up and anchor. The vessel may then be warped in. But if merely intending a cursory visit, the outer anchorage appears good.*

Proceeding from Broughton bay to port Haddington, after rounding the north-east end of the Pa-chung san breakers, and running to the westward the length of the island, haul close round the north-west angle, and edge along southerly within about a mile of the breakers. The port will then open out, into which, with the prevailing breeze of the N.E. monsoon, it will be necessary to beat.

PA-CHUNG SAN to TAI-PIN SAN.—About 15 or 20 miles E. by N. ½ N. of the north-east extremity of Pa-chung (on the Admiralty chart it is 22 miles, but the position is there stated to be uncertain), are two low islets Mitsuna and Tarara, from which extensive reefs stretch northward and westward, and the ground is shallow and foul at 10 miles N.N.E. of them. The vicinity of these shoals ought therefore to be avoided by night, but by day the dangers are clearly denoted by breakers. After quitting port Haddington, the *Samarang* beat to the northward during the night, and endeavoured to weather these two low coral islets. She had passed the breakers, leaving them about 5 miles under her lee, when disliking the swell and colour of the sea, and finding the depths decrease to 7 fathoms, the ship was immediately tacked to the westward, and succeeded† in effecting a passage between Pa-chung san and Tai-pin san. Capt. Belcher strongly suspected that extensive banks or ledges of coral connect these islets (northward) with Tai-pin san; and a strong reason for this offers in the fact of their being included by the natives in the Tai-pin san group, when they are much closer to Pa-chungsan.

* The landing place is in lat. 24° 21′ 30″ N., long. 124° 17′ 40″ E.—*Belcher.*

† It would appear that the *Samarang* returned westward, and reached the south part of Tai-pin san by passing southward of Tarara.

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TAI-PIN SAN GROUP, the eastern division of the Meiaco simas, comprises the large island of Tai-pin san and four small off-lying islets, and is distant 50 miles from Pa-chung san in an E. by N. ½ N. direction. Tai-pin san is 15 miles long, N.W. and S.E., and is surrounded on all sides except the south by a very extensive chain of coral reefs upon which lie the four small islands. Off the south-west point is Ashumah or Kurimah; to the westward is Erabou or Yerabu, 4 miles in extent; off the north point is Corumah or Ykima, and 2 miles eastward of the same is Hummock or Ogame.

The reefs do not extend very far westward from Ashumah, unless in patches unconnected with the main belt. Off Erabou they extend 3 or 4 miles, but close towards its north-western point a deep water channel admits vessels within the belt up to Hummock island and into the main harbour of Tai-pin san. The reefs again spit out on the south-west angle of Corumah, and sweep northerly, as far as the eye can reach from an elevation of 100 feet, round to east in continuous lines of breakers, edging in towards the south-east extremity of Hummock. A high patch of rocks is situated on the north-east angle of this outer belt, probably 10 miles from the northern point of Tai-pin san. This is the Providence reef on which Broughton was shipwrecked in 1797.

Safe anchorage during the S.W. monsoon might be found inside the reefs of Hummock island, and also safe in the N.E. monsoon; but the passage in or out at that season would be attended with risk, as sudden squalls, gales, and numerous patches beset the whole eastern side of Tai-pin san. The southern coast line, from the south-east breaker patch to the south-west anchorage, does not offer many dangers if a tolerable look-out be observed, for the reefs do not extend more than half a cable from the shore and generally less.

There can be no inducements for any vessel to visit Tai-pin san; neither wood, water, nor any other necessaries could be procured. A few pigs, fowls, and sweet potatoes might be obtained for cabin use, but this would hardly warrant the risk and detention on such a dangerous coast.

The *Samarang* upon first nearing the south-west point of Tai-pin san on her voyage from port Haddington, tacked twice, rather close to two off-lying patches, and soundings having been obtained in 15 fathoms, a boat was sent ahead. Upon a given signal, for "danger discovered," the anchor was let go, and the ship found to be in a secure berth in 12 fathoms, the boat being on the reefs. This turned out to be the only anchorage at Tai-pin san; it is merely an indentation formed by the reefs connecting the western island Ashumah with Tai-pin san, and is very unsafe, a heavy sea tumbling in with a southerly wind. The observatory at the south-west angle of Tai-pin san (at the most convenient landing-place within the reefs,

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and the last rocky point towards the long sandy bay) is in lat. 24° 43′ 35″ N., long. 125° 17′ 49″ E.

YKIMA ISLAND (Doubtful), placed on the charts, as 3 miles in extent with an islet off its north-east side, and in lat. 24° 26′ N., long. 125° 26′, which position is 20 miles south of the eastern point of Tai-pin san was searched for by Sir Edward Belcher in 1844, but not seen, and by him suspected not to exist; nor was it seen by the U.S. expedition under Commodore Perry in 1856. It may be remarked that Ykima is the name of one of the small islands of the Tai-pin san group.

DIRECTIONS.*—Great caution is requisite in approaching the Meiaco sima group from the north-east, east, or south, particularly with fresh breezes, and in the absence of the sun, by the aid of which the coral reefs below water can be detected. They are here, from their greenish hue, being covered by seaweed, less distinct than at other places, and therefore, where they are not marked on the chart, it must not be presumed that the space is free from danger; for the lead will not afford timely warning.

Approaching the group from the south-west, the island of Ku-kien san from its great height will be first distinguished, presenting a round-backed summit closely clad with trees; knolls occur, elevated 2,000 feet above the sea, but as they seldom present the same appearance, owing to those nearer the coast eclipsing them, their accurate measurement could not be obtained; Adam peak, which may be noticed on a promontory on the south-eastern outline, was determined to be 1,200 feet. As the island is neared, the high rocky basaltic island of Chung-chi will show out when the western limit of Ku-kien san bears northward of N.E. by N., and working for this islet no danger can be feared, and should night befal, all the space on the north-west of Ku-kien san up to the island of Kumi is safe.

The *Samarang* entered the group from the westward, passing southward of Chung-chi and within 2 miles of the southern reefs or breakers off Hasyokan or Sandy island, and standing on close hauled to the eastward, intending to make Ykima, and beat up from it to Tai-pin san. On the morning following, not seeing Ykima (supposed not to exist), and the weather being very boisterous, she stood back to the westward to get under the lee of Pa-chung san, and endeavour to reach some place of shelter. On nearing Pa-chung san she ran down its eastern and southern side, reaching the south-western extremity of its reef about 4 p.m.

* Capt. E. Belcher, H.M.S. *Samarang*, December 1844, from whose surveys and descriptions the above has been compiled.

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Here was a barrier of breakers as far as the eye could reach from the mast-head, and apparently connecting Sandy island with the group of larger islands. An opening, however, was found into the reef on the south coast of Pa-chung, and after due examination the vessel was shot up into 13 fathoms, into Broughton bay, and warped into a snug position, where she was moored with just sufficient room to swing, the depths up to the coral ledges varying from 13 to 7 fathoms. Had the weather been thick, or had night set in before the reefs were sighted, it is highly probable that the ship would have been endangered, as it was subsequently found they were a complete labyrinth similar to the Bermudas.

Vessels* should not venture near these islands after dark until the dangers have been more closely examined. From the western limit of Chung-chi island to the eastern range of the breakers of Tai-pin san, the space is dangerous. Independent of the many reefs which connect the islands, the constant strong winds, with haze and rain during the N.E. monsoon, render the approach at that season, unless in a clear day, very hazardous.

Of the dangers on the northern side of the group, all that is known has been said, and no off-lying shoals appear to exist westward of Pa-chung san. But it is not considered prudent that any vessel should run the risk of being hampered by these islands and shoals, and therefore, when beating up to the northward, should not come farther eastward than to sight Chung-chi island. The currents as these islands are approached press more southerly and easterly than on the coast of Formosa, and stronger breezes are met as a vessel advances eastward; indeed it blows incessantly at this western group.

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CHAPTER VI.

EAST COAST OF CHINA—WHITE DOG ISLANDS TO NIMROD SOUND.

INCLUDING FU-CHAU AND THE RIVER MIN, NAMQUAN HARBOUR, WÊNCHAU AND SANMUN BAYS, AND NIMROD SOUND.

VARIATION 1° 0′ W. to 2° 0′ W. in 1884.

RIVER MIN.*—There are three main approaches to the Min; the northern, westward of Chung-chi and Matsou islands; the southern, westward of the White Dog group; and the eastern, between that group and Matsou. Caution is necessary when using any of the channels of the latter, to avoid the *Pilot; Norman Court;* and *Hebe rocks* (described at pages 326, 327).

In the event of thick or dirty weather secure anchorage may be found (during either monsoon) under Matsou or Tongsha islands. The entrance of the river (which is indicated by three buoys, the Min, a whistling buoy, to the south; the fairway, or outer, buoy; and the Aymar rock buoy, to the north) is 8½ miles N.W. ½ W. from the anchorage at the White Dogs (page 236), is formed between sandbanks, which extend 7 miles from the land, that partly dry at low water. The northern range of banks terminates to the eastward at Outer Min reef, a detached rocky patch, two peaked heads of which show at the last quarter ebb. Woufou island, 6 miles long east and west, and 4 miles broad, is situated within the entrance, and near its north-east point is the little island of Hokeang, with its two contiguous islets called the Brothers.

The city of Fu-chau stands on the left bank of the river 34 miles within the entrance, and during the survey of 1841 the navigation of the river, 4 miles below the city, was obstructed by piles of stones and stakes which had occasioned great detriment by preventing the flow of the tide, and causing the sandbanks to accumulate and shift; and as it is one of

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* *See* Admiralty Chart of the river Min, with Views, No. 2,400, scale, $m = 1 \cdot 2$ inches, with editions by Captain R. H. Napier and the officers of H.M.S. *Magpie*, 1880.

The river was re-surveyed in June 1854 by John Richards, Master, R.N., commanding H.M. surveying vessel *Saracen*. The description of the river is from the directions of Collinson and Richards, Commander E. Brooker, R.N., Nav. Lieut. C. H. Stuart Douglas, R.N., and others.

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those rivers where changes may be looked for each season, a stranger had better obtain a pilot. The river pilots are very skilful, and can be entirely depended on. The usual anchorage is off the south point of Losing island 9 miles below the city. A vessel of 11 feet draught could in 1878 reach Fuchow, but the depth is subject to constant alteration.

PILOTS.—A staff of European pilots conducts the navigation of foreign vessels entering or leaving the river Min; they are under the jurisdiction of the Harbour Master. The charge for pilotage from the White Dogs to Pagoda anchorage is five dollars per foot of draught for all steam vessels, and the same from thence to the sea. Pilots boats are always cruizing in the vicinity of the White Dogs and Matsou, or between Tongsha and the entrance; they are usually cutter rigged. The charge from Pagoda anchorage to Nantai is 1½ dollars per foot of draught.

The channel being well buoyed, the port is with proper care and attention easy of access, but in face of the frequent changes of the entrance, it would be imprudent in strangers to risk taking their ships in without a pilot. There are unlicensed Chinese pilots at the White Dogs, but these are not to be trusted, notwithstanding their numerous testimonials.

TIDES.—It is high water, full and change, at the White Dog islands at 9h. 0m., springs rise 18 feet; at Temple point, river Min, at 10h. 45m., springs rise 19 feet, neaps 14½ feet; and at Losing island it is high water at noon, and springs rise 17 feet.

It is high water at the White Dogs about two hours before the tide has done flowing at the Rees rock.

The first of the flood on the Min bar sets in from the N.E., and running with great strength through numerous small channels, and over the north banks inside Rees rock, sets across the entrance of the river, passing Sharp peak direct for Round island, gradually changing its direction for Hokeang island, as the tide rises. The first of the ebb comes from the direction of Round island, and sets across the Sharp peak entrance over the north banks; as the tide falls, the stream takes the regular channel.*

Outside Rees rock the ebb runs strong to the eastward till nearly low water, when it changes its direction to S.E. The flood, now coming from the N.E. turns the stream off to the southward; and near the Outer knoll it runs strong to the S.S.W. for 3 hours, changing its direction to the westward as the tide rises. After half-flood, the stream sets towards Round island, and abates considerably in strength.

* The flood tide often makes strongly to the N.W. at the outer buoy while it is running to the S.W. at Sharp peak.—Remark book of Sub-Lieut. J. F. Stuart, R.N., H.M.S. *Sheldrake*, 1879.

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At Temple point, on the south side of Woga island, the ebb runs down for nearly two hours after it is low water by the shore, and the flood-stream runs for about 1½ hours after high water.

The time of high water full and change at the city is one hour later than at Pagoda anchorage.*

DIRECTIONS.—The banks between North breakers and Rees rock have shoaled to 9 feet and thus closed what was formerly the principal or South channel, whilst the North channel has opened out with a clear, direct, and accessible passage having 15 feet on its outer bar at low-water springs.

With a 16-feet rise of tide the best time for entering the Min is from half-flood to half-ebb. The north sands of the entrance begin to cover at a quarter flood. At low-water springs they dry about 3 feet; at neaps they do not show. In fine weather the North and South breakers appear from half-ebb to half-flood, and the Outer knoll, which has only 10 feet on it, seldom until after the last quarter; but in bad weather a line of breakers extends from the Outer knoll across the north bank, and a continuous line from the South breakers to Black head.

Outer Min Reef† is a dangerous reef lying off the centre of the entrance to the Min, midway between the North and South channels. It is nearly half a mile in extent, and uncovers at the last ¼ ebb. In clear weather it may be passed outside at a mile by keeping the summit of Tong-sha S.E. by S. till Rees rock is open southward of Wou-fou island. From this position the entrance of the North channel is W.N.W. 4 miles.

Buoy.—A red and black chequered automatic whistling buoy, 10 feet in diameter (with the word *Min* painted on it in white) is moored off the northern extremity of the Min reef, in 11 fathoms water, with the following bearings, Chang-chi peak N. 49° E., Sharp Peak N. 73° W.

Rees Rock is a small black rock which never entirely covers. It is marked by a beacon built of granite.

North Breakers Buoy.—A *black* buoy with black diamond-shaped cage, has been recently moored in 10 feet, to mark North breakers bank. From the buoy, Sharp peak bears N. 81° 30′ W., and Round island S. 62° W.

South Channel is now disused by large ships. The leading mark in; Rees rock in line with the north extreme of Hokiang, N.W. by W. ¼ W., is the direct course from Breakwater rock off the west point of Tong-sha,

* Remark book of H.M.S. *Lapwing*, Commander W. Scott, R.N., 1879.

† The outer Min reef breaks, and is visible over a mile in rough weather.—Nav.-Lieut.'s Remark book, H.M.S. *Lapwing*, 1879.

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and may be kept on till Black head is S.W. or Sand peak S.W. by W. ¼ W. when haul up N.N.W., allowing for tide on this course, into North channel.

North Channel.*—The small Round island seen midway between the Serrated peak and the hill to the south of it S.W. by W. ¾ W., leads over the Outer bar and up the channel, until Kushan peak is in the middle of the saddle of Square peak bearing W. ¾ S. With these latter marks, run in until the highest part (white patch) of West Brother is on with the right fall of East Brother W.N.W., which leads over the Inner bar, in 10 feet at low water. This bar is very narrow, and the marks must be carefully attended to. The inner bar is to the southward of Sharp peak island, the peak of which, 616 feet high, is a prominent landmark.

It is stated that the depth on the outer bar (North channel) has shoaled in some places to 9 feet at low water spring tides.†

A rock, over which there is a depth of 5 feet, lies westward of Sharp peak point, between that point and the red buoy lying 3 cables West of it.

Buoys of North Channel.

Outer or No. 1 Buoy, a fairway buoy in 7 fathoms off the northern entrance of North channel, is about 3 miles N.W. ¼ N. from the outer part of Outer Min reef. It is 10 feet in diameter, painted *red* and *black* (horizontal stripes), and surmounted by a black cage 18 feet above water. From the buoy Sharp peak bears W. ½ N., and Rees rock S.W. ⅞ W.

Middle or No. 2 Buoy is a fairway buoy, in 2½ fathoms, and about 2½ miles S.W. by W. ¾ W. from Outer buoy to which it is in all respects similar, except that its cage is in the form of a truncated cone. From it Sharp peak bears W. by. N. ⅞ N., and Rees rock S.W. ½ S.

Inner or No. 3 Buoy is also a fairway buoy, in 6½ fathoms, and lying about 2⅛ miles W. ½ S. from Middle buoy, with Sharp peak bearing

* Lieut. J. B. Haye, R.N., remarks :—"If the weather is at all thick the first two leading marks (from the 1st to the 3rd channel buoys) are often obscured, and it is rather the exception to see Kushan on the 2nd bearing, as it is usually clouded. Between the inner channel buoy (No. 3) and Sharp peak point the tides run very strongly nearly directly across the channel, and care must be taken to keep the marks on. The Brothers always show up well, but the mark of the Brothers cutting given in the directions is short; there is, however, a hill immediately behind them, which, when on the line of bearing, makes the mark better. By keeping Woga Fort in line with Sharp Peak point when this mark opens a vessel *will have the deepest water over the bar*. Pass one cable off Sharp peak point. The *red* (Eme rock) buoy has often been washed away."—Remark book of Lieut. J. B. Haye, H.M.S. *Sheldrake*, 1879.

† Commander Gamble, R.N., H.M.S. *Espoir*, 1883. The outer bar has shifted northward. For light draught vessels the old marks are right; but at *low water*, or if of deep draught get the outer buoy in line with Water bay, Matsou island, and steer in, until Round island is in line with 2nd gap left of serrated peak.—Lieut. Pollard, R.N., 1883.

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N.W. ½ W., and Round island S.W. ⅞ W. It is precisely the same as Outer buoy. Entering, Nos. 2 and 3 buoys should be passed to the northward.

ENTERING the RIVER. — Dangers. — On the south-western extremity of the shelf off Sharp peak island is a sunken rock (*Eme rock*), having 8 feet on it at low-water springs, and on which the British ship *Eme* struck in August 1872. *A red nun buoy*, 6 feet in diameter, is now moored in 14 feet, low-water springs, on the southern extremity of the rock, with Sharp peak point bearing E. by S. ¼ S., and Sharp peak N. by E., easterly, and on the north side of the first reach of the river, off the point under Woga fort (which is a circular building on the summit of the southern hills of Woga), is the *Zephyr rock*, with only 5 feet on it, at three-quarters of a cable from the shore: there are 5 fathoms inside it.

Off Temple point are two patches of 2 fathoms; also, in mid-channel, 3 cables off the point, is the Temple or Six-feet sunken rock, marked by a *red* buoy (*Temple rock buoy*) which is moored in 4½ fathoms water near the southern extremity of the rock, to the southward of which vessels should pass. When on this rock Woga point is in line with Sharp peak.

On the south bank, on the mud spit which extends westward from West Brother and abreast the Six-feet rock, is a patch of rocks (*The Wild Duck rocks*) which show at low water.*

Anchorages.—The best position is said to be with East Brother S. ½ E., and Sharp peak point E.S.E. In the N.E. monsoon, the high land of Woga in line with or a little open of Temple point is a good line to anchor on; in the S.W. monsoon Woga creek is the best anchorage.

Kinpai Pass is dangerous to strangers, particularly at or near spring tides, for then the violence of the current produces eddies among the rocks, that occasionally cross the channel, and render the vessel totally unmanageable, even in a fresh breeze; it therefore should never be taken without a pilot or personal knowledge, and then at slack tide. On the flood a dangerous eddy extends from Kinpai point above it, in the direction of the Ferry; and for this reason, the passage north of the Middle Ground is considered the best.

Oriental Rocks, on the north side of the Kinpai pass, are covered at high water: they are marked by a beacon on the eastern end. This *beacon*, which bears rather more than 1½ cables due south from the square tower on the northern shore, consists of a spar mounted with a cage 14 feet

* These rocks lie due South of the Temple at Temple point in line with the red buoy 50 yards from the low-water mark of the north tail of the mud spit.—Remark book of H.M.S. *Lapwing*, 1879.

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above high water. On the cage are painted the words *Oriental rock* in *white*. Vessels are liable to be set on to the rocks by the flood tide; they must pass to the *south* of the beacon, and not nearer than 100 feet.

Wolverine Rock, with 9 feet over it, lies S.W. by W. ½ W. from the north extreme of Kinpai point, and S.S.E. ½ E. from the Hill marked 500 feet high one cable from the shore.

Enter the pass south of Pass island and the Oriental rocks, and when past White fort, close the northern shore, which is steep-to, until Serrated peak is in line with the Ferry house on Woufou, S. ½ W., which mark leads across between the Middle Ground and Quantao shoal in not *less* than 3 fathoms. The serrated peak is however often obscured by clouds. This is also a good line for vessels to anchor on when coming down the river, and waiting for an opportunity of dropping through the Pass.

The danger of this passage is in passing the northern shoulder of the Middle Ground, which forms a sharp angle with only one and three-quarter fathoms on it at low-water springs; from this point to the shore the distance is only 2 cables. After clearing this spot, in passing either up or down, the tide will tend rather to set the vessel from the bank into the stream. The highest part of Pass islet in line with White Fort bluff outer extreme is a near clearing mark for the northern shoulder of the Middle Ground. It is recommended to shut Pass islet in altogether until past that point, opening it again immediately afterwards.

Middle Ground is 6¼ cables long in an east and west direction, with 11 feet on its shoalest part, which lies W. ¼ N. 6¼ cables from Kinpai point and 2 cables from the northern shore.

There are also three patches of 12 feet, lying W. ¼ S. 2½ cables, W. ¼ S. 4½ cables and W. by N. 5¼ cables from Kinpai point.

A bank of 12 feet lies 8¼ cables W. ¾ S. from Kinpai point.

This shoal is reported to have more water on it than formerly. The bank extending from the shore at the Ferry house is said to have shoaled considerably.*

Directions.—Small vessels may cross Middle Ground by keeping a square tower on the northern shore in line with a small white Joss house on the extreme of White Fort point bearing E.N.E. least water 14 feet, this mark must be carefully attended to as it leads close to 12 feet.†

* Remark book of Commander B. E. Cochrane, H.M.S. *Lily*, 1879.

† At the position on the Middle ground where junks are allowed to discharge ballast (viz., with Oriental rock beacon just open South of the summit of Pass island N. 71° 30′ E.; and the 1st point eastward of Momin bearing N. 40° W. 3¾ cables), there is sometimes as little as 1¾ fathoms; but this shoal water is not permanent. The small islet off Kinpai point is called Salamis island.—Captain R. H. Napier, R.N., H.M.S. *Magpie*, 1880.

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Vessels drawing more than 13 feet, if crossing at low water, must take care not to get too near the southern shore, as an island and bank have formed off the Ferry house; the bank dries 3 feet.

Shoal water extends 4½ cables off the Ferry house.

Tides.—High water, F. & C., Pass island, 10h. 50m.; springs rise 19 ft.

Tongue Shoal, which is steep-to, skirts the Wou-fou shore, extending more than half across the river. Its elbow with only 7 feet water, which is the most necessary part to avoid, is half a mile N.N.E. of Half-tide rock, and may be cleared by keeping the Ferry-house midway between Kinpai bluff and the tower, until the highest point of Kowlui head comes in line with Half-tide rock.

Half-tide Rock and Beacon.—Half-tide rock, near the upper end of the Tongue shoal, is marked by a stone beacon like a monument painted *black*. From this to Tintao, two miles higher up, the bottom is very irregular.

Mingan Pass.—Proceeding upwards, the river narrows at the Mingan Pass, where the land rises on either side to 1,500 or 2,000 feet. About three-quarters of a mile above Mingan, and on the same side of the river, is Couding island, off the east point of which H.M.S. *Scout* grounded on a rock at the end of a ledge projecting 25 yards from the islet, with 7 feet near its extreme.

Buoys.—At the upper or south end of the gorge, where it opens out, and on the east side of the river, are Spiteful and Flat islets, which must be left on the port hand. The black buoy marking Spiteful rock is moored about three-quarters of a cable to the south-west of Spiteful island. The red buoy on the opposite side of the channel marks the south-east end of a reef which has 5 feet least water, and is about three-quarters of a cable long. From the buoy the west extreme of Flat island bears S.E. by S., and the west extreme of Spiteful island N.E. The highest mound on Flat island in line with the centre of a white building on Younoi bluffs, leads to the eastward of the rocks, and between the two buoys.

Some of the pilots use the channel lately formed to the northward of the red buoy—which channel has 3 fathoms at half tide—and thus avoid the sharp turn between Spiteful and Flat islands. Local knowledge is required in using this passage.

To pass between Spiteful rock and Losing spit, and avoid the latter, do not shut in Younoi head with Flat I^{d} until Black Cliff head (marked with a white spot), is in line with the northern edge of Spiteful Island.

The bank stretching north-east from Losing island is reported to be extending southward; a shoal of 9 feet exists, from which the south extreme of Spiteful I^{d} bears N. 37° E., Flat I^{d} N. 65° E., and Pagoda S. 55° W.

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Tui-chi rocks and buoy.—A ledge of rocks about 1¼ cables long N.E. and S.W., and ½ a cable wide, having 9 ft. over it, lies about 2 miles N.E^{d} of the Custom House landing, on the river's right bank, close S.E^{d} of the track of vessels. A *black* nun buoy, has been moored on its northern edge.

Pagoda Rock, Beacon, and Light lie off the south point of Losing island. The rock dried formerly at low-water springs. The beacon is of iron, 28 feet high, surmounted by a *red* cage and a *red* light, 14 feet above high water, is exhibited from it from sunset to sunrise.

Mamoi Rock and Beacon.—Mamoi rock (which is only covered at high water), lies N.W. by W. ¼ W. 6 cables from Pagoda rock. The beacon consists of a pole, with cage, painted *red*.

THE ANCHORAGE for foreign vessels is at Losing island, generally called Pagoda island and anchorage, owing to the existence of a small pagoda at this spot. The best anchorage is between Pagoda rock and about half a mile above it, but should this be full, a vessel should anchor near the south shoulder of Losing island, where she will be out of the strength of the tide.

Lieut. Carey commanding H.M.S. *Moorhen* remarks :—

"The passage between Pagoda rock and the Pagoda has filled up considerably, in some places having only 10 feet at low-water springs, but that to the southward of the Pagoda rock has, on the other hand, increased in depth, and widened. It is therefore advisable on approaching the anchorage to pass Pagoda Rock beacon on the starboard hand."

The Custom House authorities place a harbour pilot (generally a Chinese) at the disposal of vessels wishing to take a berth inside the Pagoda rock; his services are *very necessary*, as the channel is subject to continual change.*

The river is navigable for vessels ¾ of a mile above the pagoda on Losing island; but the channel is narrow, the tides strong, and the latter anchorage generally preferred. A running moor is not recommended on the flood tide. Pagoda anchorage is reported to have shoaled considerably.

Here, at a distance of 10 miles from the city of Fu-chau, foreign vessels, with the exception of small schooners or steamers of very light draught, are obliged to anchor, farther approach to the city being prevented by difficulties of navigation and lack of sufficient depth of water, the natural shallowness having been largely increased of late years through shoaling caused by the barrier constructed in 1841, with the object of preventing access to the city by the British ships of war. The channel of the river is very tortuous, and is said to be constantly changed by heavy freshets.†

* The red buoy just above Pagoda rock beacon is now in only 5 feet at low water and between Losing island and Pagoda rock it now almost dries.—Remark book of Lieutenant A. G. Tate, R.N., H.M.S. *Vigilant*, 1882.

† H.M.S. *Moorhen* moored off Fuchaufu in 1876.

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The imperial dockyard and arsenal is under foreign superintendence. The various establishments are in complete working order, and capable of constructing five war ships annually.

Dock.—There is a dock here owned and managed by Europeans. Its length is 400 feet over all, breadth 55 feet at entrance, 80 feet at top, and 40 feet at bottom; depth over sill, 15 to 17 feet at ordinary spring tides. It has an average depth of water at springs of 17 feet, and at neaps of 14½ feet. Steam power is used for pumping dry. The following is the scale of charges:—Hire of dock for day of entrance and two following days, one Mexican dollar per registered ton; after that period sixteen cents per ton per day, excepting when vessels enter for heavy repairs, or iron ships for the purpose of scraping and painting their bottoms. A tug steamer is attached to the dock; charge, 35 cents per gross ton.

There is also a patent slip at the Chinese arsenal 304 feet in length (over all). Vessels are raised sideways. The cradle is in two parts, and may be used separately or together; separately, will take up two small vessels, together, will lift vessels of 2,000 tons.

Supplies.—Coal is to be obtained, both British and Kelung, from floating hulks and from coal stores on shore.* There are some general stores in the place, and boarding houses kept by Europeans. Beef and poultry are the staples of animal food. Foochow bacon and hams are much prized, and largely shipped to all parts of China. Game and wild-fowl are to be had in their season, and occasionally venison. Fish abounds in great variety, and oysters are very plentiful in the cool months, but are dangerous if eaten raw. Fruit and vegetables are abundant, and excellent potatoes are largely grown for the supply of foreigners.

Trade.—The following is extracted from the consular report on the trade of Foochow for the year 1881:—

"The imports and exports this year come to 15,109,907 Haikwan taels, equal, at 5*s*. 8*d*. per tael, to 4,281,140*l*. 6*s*. 4*d*., against 16,023,930 Haikwan taels, or 4,673,646*l*. 5*s*. in 1880.

"The trade, so called foreign, because of the duties upon it, being collected by foreign employés, has yielded a net revenue of 2,022,934 Hk. t. 2 m. 6 c. 4c., equal to 573,164*l*. 15*s*. 2*d*., as compared with 2,167,463 Haikwan taels, or 632,176*l*. 14*s*. 2*d*. in the previous year, although ninety-four steamers under the Chinese flag participated in the trade.

"The number of vessels employed in the foreign trade inwards and outwards is 597 of 473,735 tons, viz., 491 steamers of 429,561 tons, and 106 sailing-vessels of 44,174 tons; of this number 74 entered and 27 cleared

* Coal is usually obtained by local contract for H.M. ships.

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in ballast. Of the 597 vessels entered and cleared, 459 were British, of 396,721 tons. A large proportion of the steamers are small craft employed in the carrying trade on the coast between Shanghae and Foochow northwards, and between Foochow, Amoy, Swatow, and Hong Kong, the terminus in the south. The Chinese steamers, ninety-four in number, are engaged solely in the coast trade between Shanghae and Foochow, so that this class of steamers making a number of trips during the year, figure in the shipping list several times over. The large steamers are chartered on foreign account for carrying teas during the six busy months to London and the Colonies."

The principal foreign imports are cotton and woollen manufactures, metals, and opium; and the native imports bean cake, beans and peas, coal, tea mats, oil, sugar, &c. The exports are tea, paper, oranges, woods, &c., but tea is the chief staple of importance in the commerce of Foochow, the value of which in 1881 was 5,594,000*l.* The year 1863–4 brought a sudden expansion in the export of tea, which in that year amounted to 64,000,000 lbs.; and the annual quantity has increased to 110,725,000 lbs. in 1881. There is also a considerable coast trade in timber. The duties are paid in Sycee silver; or in Mexican dollars, "chopped" or clean, at 10 per cent. discount.

Climate.—The climate of Foochow is similar to that of Canton, excepting that the summer heat is less tempered by the monsoon, and that a somewhat greater degree of cold prevails. Summer sets in with May, and lasts until the early part of September, when north-westerly winds set in. July and August are excessively sultry, and during these months in 1866 several cases of death from sunstroke and heat-apoplexy occurred, simultaneously with the occurrence of numerous fatal cases of the same kind at Shanghai and on the Yangtze; whilst Hong Kong and Canton remained altogether exempt from mortality under this head, in consequence of the tempering influence of the S.W. monsoon. Frost and ice, although rarely seen at Foochow, are nevertheless occasionally known; and in February 1864 some two inches of snow fell upon the surrounding hills, an event not remembered for 40 years before. In ordinary winters the temperature seldom falls below 38°; whilst the range of summer heat is from 80° to 96°. Notwithstanding this moderate degree of cold, however, the thickest winter clothing used in England is required for health and comfort during the months from December to March.*

FUCHAU FU (or Foochow) was opened to foreign commerce by the Treaty of Nanking in 1842. The city is built on a plain, and lies about three miles from the river side, to which it is connected by a line of

* *Treaty Ports of China*, page 284.

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suburbs. The foreign hongs and British and other foreign consulates are principally at Nantai on the opposite or south bank of the river, which is connected with Fuchau by a massive stone bridge. So also are the church, hospital, cemeteries, &c.

The Min river is upwards of 300 miles in length, and, with its numerous tributaries, drains and gives access to fully three-fourths of the province of Fu-kien.

LEAVING the RIVER MIN.—In dropping through the Mingan Pass with the ebb tide, it will be necessary to guard against a dangerous eddy setting from the point above Couding island, on to the Scout rock.

On leaving the river, take care that the set of the tide across the channel between Sharp-peak point and Rees rock does not force the vessel on the shoals on the north side of the channel. Fair anchorage in 6 fathoms, to stop during a tide, will be found with Rees rock bearing S.S.E.

Europe Rock.—This rock, on which the steam vessel *Europe* struck on 5th September 1882, and became a total wreck, is reported to lie about 4 miles seaward of Woga channel, approach to Min river from the north-eastward. It is stated, on the authority of the master of that vessel, to consist of two small pinnacles, with a depth of about 5 feet over them at low water, and lying with the following bearings and distances:—Highest (northern) part of islet lying $7\frac{1}{2}$ miles N.N.E. $\frac{1}{2}$ E. from Sharp peak (Sharp peak island) N. $\frac{1}{2}$ W., distant $3\frac{8}{10}$ths miles; Pinnacle (Tigers claw) islet S.W. by W. $\frac{1}{2}$ W., $4\frac{4}{10}$ miles. Pagoda (not marked on plan) on high land about $5\frac{1}{2}$ miles N.N.W. from Sharp peak; W. by N. $\frac{1}{2}$ N.

The position of Europe rock is indicated at low water by ripples or breakers. About two minutes before the *Europe* struck, Round islet was observed to have become open of the eastern point of Woufou island.

Woga Channel.—The junks generally use the Woga channel between Woga and Sharp Peak islands, but to the northward of the latter island there are several sandbanks which show at low tide, with not more than 6 to 9 feet water between the banks. Small steamers may proceed to sea by this channel with considerable advantage in the N.E. monsoon, as they are enabled, with fore and aft sail, to fetch up between Matsou and Chang-chi, and if bound to Formosa, a very weatherly departure is ensured. A pilot, however, should be taken and due caution exercised, because the banks are liable to change, and personal knowledge is requisite for the safe navigation of the channel.

SOUTH COAST PASSAGE into the River.—South of Woufou there is a passage, over the flats at entrance, and along the mainland, by which the Min is entered, about 6 miles below Pagoda island and

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10 miles above Sharp peak. Large junks use it, and the English pilots, occasionally, to save time, as the distance is about 5 miles shorter than by the main channel. The course they take is to follow the land at about a cable after rounding Kowlai head (passing outside Cone rock and the rock off Sharp pagoda) until close to Sand-peak point, when it is necessary to steer out to avoid its off-lying rocks. The mark out is Sand peak kept between the two rocks on Sand peak point until Rees rock comes on with the north extreme of Hokiang, N.W. by W. ¼ W., the leading mark out of South channel.

On entering the South passage,* which should only be used by small steam vessels after half flood, the deepest water is found with Square peak on Wou-fou island bearing from N.W. by W. ½ W. to N.W. by W. ¾ W., till the highest peak left of Serrated peak is in line with the outer rock off Sand peak point, W. ¾ S. Keep on this leading mark until close in, passing the outer rock at a cable, from which steer well open of Meewah town point. The banks off Triangle head, shoal gradually. Sand island covers at high-water springs. The most difficult part of the passage is between Sharp pagoda point and the rock lying off it, as there is a mud bank close to the shore on the west of the point, and another close to the west of the rock. There is also a narrow passage north of the rock. The rock covers at high-water springs, and one a few yards north of it, at half tide. There is a great eddy here. After passing this steer moderately close to each point, and very close to the western side of Kowlui head, and then follow the shore till Mingan pass is entered in order to avoid the bank on the north side of the channel. A new island has formed on a bank less than one mile E. by S. of Kowlui head.

AYMAR ROCK, on which the U.S. barque *Benjamin Aymar* struck in 1878, is small with 3 feet water; and 9 to 10 fathoms, mud, at 1½ cables around. From the centre of the rock Changchi island peak bears N. 68° E., Middle Dog island lighthouse S. 37° E., Sea Dog island summit S. 59° E., and Sea Cat island summit S. 71° E.

Clearing Marks.—South extreme of Changchi island in line with North extreme of Matsou island bearing E. by N. ½ N., leads south, and Crab island N. ½ W. leads east of Aymar rock.

Aymar Rock Buoy.—At about 3 cables east of Aymar rock, and moored in 11 fathoms water, is a *red* and *black chequered* buoy 6 feet in

* These directions are by Navigating Sub-Lieutenant Alfred G. Joll, R.N., H.M.S. *Dwarf*, 1873.

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diameter. It is surmounted by a black diamond-shaped cage. The name "Aymar" is painted on the buoy in *white* letters.

MATSOU ISLAND lies north-east of the entrance of the Min, and North 10 miles from the western White Dog; and between the two and N. by E. ¼ E. 6½ miles from the latter is a precipitous black rock, the Sea Dog, 145 feet high, with reefs to the northward and westward.

HEBE ROCK is a dangerous pinnacle, about 50 feet in extent, and steep-to, with 11 feet over it at low-water spring tides, and 13 to 14 fathoms mud, to the north-west and southward. It lies with the following marks and bearings:—

Reef island summit seen in the gap between Changchi island peak and Nob peak (Changchi island), but nearer Nob peak.

The Northern breakwater rock (Tong-sha island) in line with Hai-tan island summit.

Sea Cat islet	-	N. 25° E.
Sea Dog „	-	N. 32° E., distant 1¼ miles.
Tong-sha island summit	-	S. 9° W.
Matsou „ „	-	N. 14° W.

Eastward of Hebe rock, at the distance of one cable, is a shoal spot with 4¼ fathoms over it.

Between the Sea Dog and the east end of Matsou are three other rocks above water, the "Pup" (16 feet), Sea Cat (20 feet), and Flat rock, 12 feet high. They should not be approached within the distance of 2 cables.*

NORMAN COURT ROCKS, on which the British ship *Norman Court* struck in 1876, consist of two pinnacles lying North and South from each other, distant 1¼ cables. The northern pinnacle has 6 feet over it at low-water spring tides. The southern pinnacle has 9 feet over it at low-water spring tides, and lies with the following bearings viz., Flat rock N. 7° W., distant 4¾ cables, Matsou island peak N. 69° W., and Sea Dog S. 5° W.

A rocky ledge with 6 fathoms water over it extends S.E. by S., 1¼ cables from the Southern Norman Court rock.

A rocky patch of 2¼ fathoms lies S.S.E. ¾ E., distant 2¾ cables from Flat rock.

Caution.—This foul ground should be carefully avoided when passing the locality.

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* Between the Pup, Sea Cat, and the Norman Court rocks, are deep water channels, apparently free from danger. H.M.S. *Magpie* used all three on several occasions. —Captain R. H. Napier, R.N.

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PILOT ROCK, on which the sea breaks at low-water spring tides (originally discovered* by the river Min pilots), is a pinnacle rock with one foot water. From the rock Changchi island peak bears N. 17° W., Sea Cat island summit S. 87° W., 3¼ miles, and Sea Dog island S. 63° W.

ANCHORAGE.†—A good roadstead will be found on the western side of Matsou during the N.E. monsoon, and good shelter in the deep bay on its northern face in the S.W. monsoon. H.M.S. *Hornet* anchored in the latter bay, July 1857, and was well sheltered in 5 fathoms, muddy bottom, at a third of a mile off shore, with the west extreme of bay N.W. ½ W., east extreme E.N.E., centre peak of bay S.W., and Pastel rock N. by E. ½ E. There are several villages round the bay, and fish, goats, and a small quantity of poultry may be procured; fresh water can be obtained in both bays.

SWALLOW ROCK.—A pinnacle having 7 feet water over it at low water spring tides, on which the British barque *Sea Swallow*, drawing 13½ feet, struck at low water on 6th May 1882; is situated on the northern side of the channel between Changchi and Matsou islands.

This rock lies with the small islet on the south-east side of Chanchi island bearing N.W. ½ N., distant 1¾ cables. A ridge of 6 fathoms, on which there is a pinnacle of 4½ fathoms, connects the south point of Changchi with the islet.

CHANGCHI ISLAND, at 1¾ miles north-east of Matsou, has on it two remarkable sharp peaks, the highest being 1,030 feet above the sea. Off the northern face of the island are several islets, the largest of these, Gordon islet (which has foul ground extending for nearly a mile from its north-eastern shore), bears North 2½ miles, but there is no safe passage between them. N. 56° E. 1¼ miles from the north point of Gordon is a small black rock, about 25 feet high, surrounded by a reef, and a second, 10 feet high, lying North-west 1½ cables from its North point.

Gordon Rock lies 4½ cables W.N.W. of the islet off the west point of Gordon island, dries 7 feet at low-water spring tides, and is steep-to, 9 to 11 fathoms being obtained all around except on its north-east side, where shoal water extends three-quarters of a cable.

From the rock—

North point of Gordon island bears - -	N. 53° E.
Changchi peak - - - -	S. 20° E.
South Claret rock - - - -	N. 72° W.

* Commander T. Colvile, H.M.S. *Camilla*, Dec. 1859.

† H.M.S. *Sheldrake* obtained good anchorage, well sheltered with the wind at N.E. in the northernmost of the two large bays on the west side of Matsou island.—Nav. Officer's Remark book, H.M.S. *Sheldrake*, 1877.

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At half a mile S.S.E. ¾ E. from the islet of the south point of Changchi are two rocks always above water; and West 1¼ miles from the south point is the Pastel rock.

N.E. by E. ½ E. 2 miles from the north-east point of Changchi, and with a channel between them, are three peaked rocks named the Trio, about 50 feet in height.

Anchorage.—The bay on the south side of Changchi affords good shelter in the N.E. monsoon, but a heavy swell rolls in at times. Vessels entering from the northward can round its eastern point close-to, and anchor within the point, in 6 fathoms. Either this or the anchorage on the western side of Matsou, which is preferable, should be used by sailing vessels bound to the river Min during the N.E. monsoon, as they may always get to the bar from hence the precise moment they require it, whilst from the White Dogs a vessel will barely fetch.

ALLIGATOR ISLAND, or Tungsha, in lat. 26° 9′ N., long. 120° 26′ E., is a barren rock, about 40 feet above the sea, bearing East 22½ miles from Matsou island, and N.E. by E. ⅓ E. 26 miles from the south end of the White Dogs.

LARNE ROCK and LARNE ISLET.—N.W. by W. 12¼ miles from Alligator island is Larne rock, low and flat, with a reef lying 2 cables north of it. Larne islet, bearing N. by E. 5½ miles from Larne rock, has ledges extending from its north and south ends. It is about 200 feet above the sea, with large boulders sticking up here and there; near its summit are three houses.

BLACK ROCKS, the highest of which is 70 feet high, are distant 7¾ miles W.N.W. from Larne islet, 23 miles N.E. from river Min entrance, and 6¾ miles E. ¼ N. of Ragged point on the mainland. *The position of the reef* (showing at low water) charted E.N.E. 5½ miles from Black rocks, is said to have been passed over on several occasions, without any indication of shoal water being seen.

TUNG-YUNG, the easternmost island on this part of the coast, bears E. ½ N. 13 miles from Larne islet, and its summit rises 855 feet above the sea. Its appearance is level and flat, with steep cliff shores, and a large village stands on its western side; off its south extreme is a ledge of rocks.*

Anchorage.—There is a good anchorage in the N.E. monsoon in 10 fathoms, at half a mile southward of the small island lying off the north-west point of Tung-ying. This island appears as part of Tung-ying, except on a N.E. by N. or S.W. by S. bearing; off its N.E. point a reef projects for ½ a mile.

* A rock has been reported by Mr. Croad of the *Taheu*, as lying N.E., 6 miles from Tung-Yung island.—Captain R. H. Napier, R.N., 1884.

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CONY is a remarkable conical island, lying W.N.W., 19 miles from Tung-yung; a reef extends 3 cables off its north-east shore, otherwise the channel, nearly 1½ miles wide, between it and the two islands north of it, is safe. A rock awash at low water, lies East 1½ miles from the cone, and another S.E. ½ E. 1¾ miles; from the latter, S.W. of which there is uneven ground, the south end of Spider island bears W. ¾ N.*

SPIDER ISLAND is 3¼ miles westward of Cony, and its highest part is 620 feet above the sea. There is a large village in a bay on its south side, a reef off its south-west point, and four small islets off its north-east face. Between it and the main, which is 5½ miles distant, there are three other and larger islets; between the first and Spider island is a half-tide rock; the centre one, named Isthmus, has a sandy isthmus, and a mud bank extends westerly from it, but the channel between it and the first islet is clear. The passage between Isthmus and Inside islet, 1¼ miles to the westward, is obstructed by a reef, some rocks of which uncover at half-tide and which extends 6 cables E.N.E. from Inside. The channel between the latter islet and Cox point has 6 to 4 fathoms and is a mile wide. West of Spider and southward of Isthmus are the two groups of Larva rocks with a channel between them; two rocks on each are above water. The channel between Isthmus and Larva is contracted to a mile by reefs extending northward from both the latter groups.

Anchorage.—There is good shelter from N.E. winds on the west side of Spider island.

TING-HAE BAY, formed on the west side of a peninsula of the mainland 13 miles westward of Changchi, affords safe anchorage in 2½ to 3 fathoms in the N.E. monsoon; there are the remains of a walled town here, but the place is nearly deserted.

Fronting this bay to the southward and south-east are many islets and rocks. The outermost (four islets above water, named Square rocks) lie 3 miles to the southward, with reefs extending northerly from them. To the north-east of them is Crab islet, surrounded by reefs, which extend off its north-west part at least half a mile. In the channel between Crab islet and Ting-hae point are two islets.

WANKI BAY, 6 miles E.N.E of Ting-hae, is frequented by junks, but although it affords them good shelter it cannot be recommended for larger vessels. There is a rock, which shows at low water, lying near the centre of the bay at 7 cables off shore, with Pe-kyau point E. ½ N., and the nearest Claret rock S.E. by S.

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* *See* Admiralty Chart:—East Coast of China, Sheet 6, No. 1,754, scale, $m = 0{\cdot}24$ of an inch, and Plan of Sam-sah Bay, No. 1,988, scale, $m = 0{\cdot}7$ of an inch.

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CLARET ROCKS are 1½ miles southward of the east point of Wanki bay. Three of them are from 20 to 30 feet above the sea, but they are all surrounded by sunken rocks, the southernmost of which lies S.W. ½ S., half a mile from the south Claret, with the hill over Ting-hae bay bearing W. ⅓ N., and the summit of Matsou S. by E. The northernmost rock lies N.E. ½ E. a mile from the north Claret, with the north end of Gordon islet in one with a small islet beyond it E. by S. ½ S. Pe-kyau point is half a mile northward of this rock; there is a channel between them, but the sunken rocks lying off the point narrow it to 2 cables; a stranger therefore should pass south of the Claret rocks, and haul up when the village in Wanki bay bears North.

RAGGED POINT is the north-east extreme of a narrow peninsula, in some places only half a mile across, which runs 5½ miles E.N.E. of Wanki bay. A quarter of a mile eastward of the point is Diplo islet, with a reef extending three-quarters of a cable eastward of it. Here there is generally a heavy tide rip, and much sea in N.E. winds. The junks use the passage between Diplo and the main, said to be a good one, but sailing vessels have no business there, as the tides are strong. Steamers, however, use this passage with safety, and frequently anchor under the small island westward of Ragged point.

SAM-SAH INLET.*—The entrance to this inlet, at 10 miles westward of Spider island, is 1¾ miles wide, with deep water and strong tides. There is a rock in mid-channel W. ¼ S. 6 cables from Castle point, from which the centre peak of Cone island bears N. ¼ W. and Steep rock N. by E. ¾ E.; to pass eastward of it keep the west end of Cone island in line with the highest peak of Crag island.

On the eastern side, close to the entrance, is a small bay with a fort in it, and here the junks remain for a tide, but the water is very deep and shoals too suddenly for vessels that cannot take the ground.

The *Plover* made a running survey of the interior of this inlet. She ran to the westward, leaving a large island on the port hand, then hauled to the northward, and found anchorage on a middle ground, three-quarters of a mile from the shore, and 5½ miles above the island. The bay extended to the northward 13 miles beyond this anchorage, terminating in a sandy isthmus, over which Fuh-ning bay was seen. The bay also runs back to the west and south-west; in the latter arm is the town of Nin-le-heen.

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* *See* Plan of Sam-sah bay, No. 1,988. Sam-sah inlet is not known by that name to the natives or European coasters. The true Sam-sah lies farther north, being a small cove at the north-east angle of Fuh-ning bay, at 2 miles N.W. of the north point of Fongho island. There is anchorage, in the N.E. monsoon in the cove half a mile eastward of it, in 3 to 5 fathoms, but it would be scarcely safe to proceed into it without the services of a pilot.—Remark Book of Navigating Lieut. John F. Barns, R.N.

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At 4 miles southward of the entrance of Sam-sah inlet is the opening to another inlet, 10 miles deep; there are 30 fathoms water at the entrance, but circumstances did not admit of its being examined.

RAG ISLANDS.—Off the entrance to these inlets, about 4 miles north-westward of Ragged point, and 7 miles south-westward of Spider island, are three islets, named Rag islands, and a mile northward of the easternmost is the Bittern rock, which covers at high water. The *Plover* anchored westward of the westernmost islet and found tolerable shelter.

TIDES.—It is high water, full and change, at Changchi island (page 327) at 9h. 30m., at Spider island at 10h. 0m., and the springs at both islands rise 17 feet. Inside Matsou and Changchi the tidal streams are very perceptible, there being a great indraught into Ting-hae bay and the northern entrances to the river Min with the flood, and the velocity off Ragged point sometimes amounts to 3 knots. There is also a great indraught into Sam-sah inlet. Off the Rag islands the tides run with great strength, and a long swell rolls home into Sam-sah bay with north-east winds.

To the northward of Changchi the flood came from the E.N.E., rate 1¼ knots per hour, and the ebb from W. by S., rate 1½ knots; also off Cony island the ebb averaged 1½ knots from W. by S. at neaps. At the anchorage inside Sam-sah inlet the ebb came from the N.N.W., and it ran 11½ miles in a tide; the flood set E.N.E. for the first 3 hours, then S.E.

DOUBLE PEAK ISLAND is 3¼ miles long N.N.E. and S.S.W., and near its northern end are two remarkable peaks, the highest of which rises 1,190 feet above the sea. It lies 3 miles north-east of Spider island, the only danger in the channel between being the rocks lying off the north end of the latter island. A rock above water lies N. by W. one cable distant from the west point of Double Peak island.*

There are two cone-shaped islets between Double Peak and Cony island, with channels between too narrow for sailing vessels, but there is a good passage between the southernmost of these islets and the reefs extending north-eastward of Cony island (page 329).

FLAP ISLAND, at 1½ miles westward of the north end of Double Peak, is a low flat islet, with a sunken rock off its southern point. There is no passage fit for vessels between this islet and the mainland.

Anchorages.—There is good anchorage in the N.E. monsoon on the south-west side of Double Peak island, to the south-east of

* Information from Nachrichten für Seefahrer, 1876.

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a small islet, with a rock above water on each side of it, lying three-quarters of a mile westward of the west point of the island; the two cone-shaped islets northward of Cony island from sheltering the eastern swell.

There is good shelter abreast the first sandy bay within the point westward of Flap island.

BITTERN ISLAND.—From Flap island the coast trends northward for 10 miles to Fielon island, and off it is Bittern island and several rugged rocks, which vessels of large draught should give a berth to and not close the shore under the depth of 6 fathoms. Bittern island is from 3 to 4 miles in circumference, and between it and the main there is a passage three-quarters of a mile wide and a mile in length, affording good anchorage in $3\frac{1}{2}$ fathoms for small vessels in either monsoon. On the north-west side of the island is a sandy cove where fresh water will be found. H.M.S. *Bittern*, when in search of piratical junks, anchored in $4\frac{1}{2}$ fathoms with Goodridge point E. $\frac{1}{2}$ N., and the extremes of the island from S. by E. $\frac{3}{4}$ E. to S.W. by S.

FUH-NING BAY.—From Fielon island the coast falls back to the westward, forming a deep but shallow bay, on the shore of which is the city of Fuh-ning. In the northern part of the entrance is a group of islets extending 2 miles from the coast. The *Plover* anchored under the south-western, named Fong-ho, which is the largest, but the shelter was not good. There is a narrow passage between the rocks off Fong-ho and those off the point.

PIH-SEANG ISLANDS.*—E. by N. $8\frac{1}{4}$ miles from the north point of Double peak island is the southern of the Pih-seang or Tsih-sing outlying group. The northern islet, named Town island, is the largest and the little cove at its south-west angle will afford shelter to one or two small vessels. Between the northern and southern islets of the group there is a channel free from rocks, but the intervening space is thickly studded with fishing stakes. A reef over which the sea breaks extends half a mile in a north-easterly direction from the north-easternmost of the Pih-seang islands.

Rock.—Eastward of east Pih-seang island, 3 cables from the shore is a rock which dries 6 feet at low-water spring tides. From the rock the

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* *See* Admiralty Chart:—China East Coast, Sheet 6. Ragged point to Pih-ki-shan, No. 1,754; scale, $m = 0{\cdot}24$ inch.

A cove exists on the south side of Country island, in which masted boats anchor.—Capt. E. M. Edmond, P. & O. S.S. *Malacca*.

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north-east end of Town island bears N. 47° W.; north point of East Pih-seang island N. 66° W.; east point of Country island S. 30° W.*

FUH-YAN ISLAND, 1,700 feet above the sea, lies North 12 miles from the Pih-seang group, and between it and the coast is a good roadstead, named Lisham bay, the anchorage in which is on the Fuh-yan side, abreast an islet and a joss house. In this bay a vessel may lie protected from westerly and southerly winds; while steamers of moderate draught will, in case of bad weather, find secure shelter by running into Little pass. The northern entrance to the bay is broad and open. To the southward are three entrances.

FUH-YAN PASS,† between Fuh-yan and Chuhpi island, narrow and deep. Very strong gusts of wind from the high land, and the strong eddies, render this pass less desirable than either of the others, and vessels using it are apt to get becalmed under Fuh-yan.

CHUHPI PASS; (between Chuhpi and Angle island,) which is 8 cables across, and excellent; but there is a patch of low rocks (which must be left to the westward) to the S.W. of Chuhpi that narrows the channel to half a mile; and there is a sunken rock off the north-east point of Angle island.

LITTLE PASS, (between Angle island and the main,) is narrow but good, carrying not less than 3 fathoms water. In the southern part of this pass there is capital typhoon anchorage for one vessel in 9 fathoms water.

Directions.—In going through from the above-named anchorage (which is abreast, *eastward* of a village) the shore on the eastern hand should not be approached to within ½ a cable while rounding the N.W. point of Angle island. Take the pass mid-channel, bringing the ship gradually round with starboard helm, so as to pass the east extreme of the island laying *north* of Angle island, at about one cable; after which a N.E. ½ E. course will lead clear over the bank.‡

Water.—Good water is plentiful and easily obtained at the anchorage in Lishan bay.

TIDES.—In Lishan bay it is high water, full and change, at 10h. 15m., springs rise 16 feet. The first of the flood came from the E.S.E., rate three-quarters of a knot, then from E.N.E., rate half a knot; the ebb ran to the N.E., rate three-quarters of a knot.

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* H.M.S. *Nassau*, 1878.

† Nearly two cables wide.—Remark Book, Navigating Officer, H.M.S. *Midge*, 1877.

‡ Remarks by Captain R. H. Napier, R.N., H.M.S. *Nassau*, 1878. The *Nassau*, drawing 13 feet, used this channel.

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DANGEROUS ROCK, in lat. 26° 53′ N., long. 120° 34′ 18″ E. has its summit 8 feet above high water, or 24 feet above low-water springs. It is 9 miles E.S.E. of Fuh-yan and 14 miles N.E. of Town island, Pih-seang group.

TAE ISLANDS.—E. by N. 16 miles from the eastern point of Fuh-yan are the Tae islands, the easternmost of which, about 400 feet above the sea, is the largest, and remarkable for its table top. Shelter in the N.E. monsoon can be had under this island as close as a vessel can safely go (say half a cable's length), but it is very bad.

Tae Islands.

Table top, E. by S. 10 miles. Strawstack.

S.S.W. ¼ W. 3 miles from the easternmost Tae island are two rocky islets named Strawstack, about 100 feet high; they almost join. Close to the north-east point of the northern Tae island is a remarkable rock, the Mushroom, 260 feet high.

Mushroom.

North 1½ miles.

A rock has been reported by the master of the steamer *Waratah* as lying about 4 miles westward of the Strawstack, and visible at low-water springs.*

Between the Tae group and Fuh-yan are the Incog islands; on the S.W. side of the western island good shelter may be found in the N.E. monsoon in 6 fathoms water at 2 cables from the shore with a mud bottom; the eastern island is 150 feet high. At 3 miles N.W. of these islands is Solitary rock, with a reef extending 2 cables in an easterly direction from it; the soundings between this and the main, from which it is distant 3½ miles, vary from 7 to 5½ fathoms. There is also a safe channel between Solitary rock and the Incog islands.

Solitary Rock, W. ¼ S. 5 miles.

Caution.—Vessels passing inside the Tae islands should keep well to the westward, as the ground in their vicinity has not been well explored.

* Captain E. M. Edmond, R.N.R., of the P. & O. S.S. *Malacca* doubts the existence of this danger. It seems probable that what the Master of the *Waratah* saw was the 8 foot rock which lies S.W. by W. ½ W. 7¾ miles from the Strawstack.—R. H. N.

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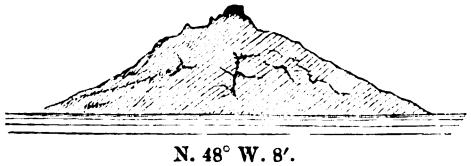
Two reefs, which show at low water, have been found; from one, with the rocks on it awash at high water, the Mushroom rock bears E.S.E. and the west end of the eastern Incog island S.W. by W. ½ W., on which bearing it is in line with the east end of Fuh-yan; and from the other, the table top island of the Tae group bears E. by S. ¼ S., and the west rock of the group N.E. by E. 1¼ miles.

SEVEN STARS are a group of rocks and islets, 2½ miles in extent, which may be passed on the outside safely at a mile. The southern inlet, about 200 feet high, which is the largest, and split into two, is 7 miles N.E. by E. ¼ E. from the eastern Tae island, and S.S.E. from Cleft rock. A rugged islet, 70 feet high, lies a mile N.E. by E. of it; and a mile farther are three low flat rocks, the easternmost of which covers, and bears S.E. ½ E. 3 miles from Cleft rock; the latter 50 feet high and having the appearance its name implies, is 8 miles N.E. by N. from the eastern Tae island.

PIH-QUAN HARBOUR.—N.W. 14 miles from the Tae group is the entrance to this harbour, between Ping-fong and Chin-quan islands and the main. To the northward there is a high and very remarkable, sharp, conical hill, Pih-quan peak, in lat. 27° 18′ 48″ N., long. 120° 28′ 42″ E., having on its summit the appearance of a cairn. The harbour is 1½ miles wide, carries a depth of 3 fathoms, and affords good shelter in the N.E. monsoon to vessels under 15 feet draught.

The island of Ping-fong (eastward of Pih-quan harbour) has off its south-east point a low rock which is never covered, and between this rock and the shore is a sunken rock. Vessels bound from the northward may round this low rock at a cable's length, and then haul up for the south point of Ping-fong, giving it and also the south-west point a berth of 2 cables. The Pih pass, between the north end of Ping-fong and the main is *very* narrow, but safe for steamers well under command.*

Pih-quan Peak.



N. 48° W. 8′.

Water.—Fresh water can be procured at Ping-fong.

* H.M.S. *Nassau* used this pass on three different occasions and found no difficulty, but as it is but from 130 to 150 yards wide, the greatest attention to helm is necessary and high speed. On the fifth day after full moon, at about quarter flood, seven fathoms was the least water obtained in the pass, at about one-third distance from the south-eastern shore, which should be borrowed on passing through.—Remarks by Captain R. H. Napier, H.M.S. *Nassau*, 1878.

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NAM-QUAN BAY and HARBOUR.*—The south point of Chin-quan island has a reef which extends one cable. A reef of rocks runs also nearly 1½ cables to the south-westward from the small islet on the south-west side of Chin-quan. Anchorage in 9 and 7 fathoms will be found on the west side of Chin-quan after a second rock has been passed. Nam-quan bay opens out to the northward as Chin-quan is passed. The soundings shoal suddenly on entering the bay, which is very shallow. The walled town of Nam-quan stands on its north shore.

Immediately westward of Nam-quan bay is the entrance to Nam-quan harbour, an inlet which runs about 15 miles in a general N.W. direction, when it appears to expand into a wide basin called Gordon bay.

Within the north point of entrance is a town. South of the town point† is a small rock which never covers, having rounded which haul up to the northward, giving the west extreme of the town point a berth of 2 cables, to avoid a sunken rock off it which shows till quarter-flood. Having arrived within the point anchor in 14 fathoms, as the mud banks rise almost vertically. On the south side of entrance is a small fort with a few houses. The narrowest part of the channel is 6 cables wide, and the strong tides and baffling winds make it necessary to have a boat ready to tow the vessel's head round. The *Plover* traced the inlet for 15 miles to the N.W. from the town point, and had then a depth of 8 fathoms; the channel is, however, narrow, tortuous, and surrounded by high hills, and there was apparently little or no traffic.

Nimrod Rock.—H.M.S. *Nimrod* when proceeding up Nam-quan harbour, January 1857, struck on a rock with only 9 feet water on it, lying about 11 miles from the entrance, and 1¾ cables eastward of a small islet on the western shore.‡

TIDES.—In Nam-quan harbour it is high water, full and change, at 10h. 0m., and springs rise 17 feet.

BOUNDARY.—The boundary line of the provinces Chi-kyang and Fu-kyen passes through Pih-quan harbour.

The COAST from Nam-quan harbour trends N.E. by N. 21 miles to Ping-yang point, and at the distance of 12 miles is Tanue bay, which is too shallow to afford shelter to any vessel drawing over 10 feet water. A low rock, named Gap islet, lies 1½ miles southward of Tanue point; and N.E. ¾ E. 4¾ miles from it is Farmer rock, which shows at low water,

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* *See* Admiralty Plan of Nam-quan harbour, No. 1,980 scale, $m = 1{\cdot}7$ inches.

† Bate island, as marked on the Chart, is only a continuation of the point. The tides run very strong here, and eddies extend off nearly all the points.—Nav. Lieutenant John F. Barns, R.N.

‡ Capt. C. C. Forsyth, R.N., H.M.S. *Hornet*, 1857.

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and lies 3¼ miles off shore, with Ping-yang point bearing N.N.W., and Tanue point S.W. by W. ½ W. 3½ miles.

From Ping-yang point the coast takes a north-westerly direction and is fronted by mud banks taking a north-north-east direction, which dry three miles from the land at low water, and on which are several small islets and rocks 5 or 6 miles from the shore. At the distance of 11 miles from the point is the embouchure of the Shwin-gan river by which the commerce of Wan-chu fu is maintained.

The bar at the entrance of the Shwin-gan has only 9 feet on it at low water, and off it are the four Tsang islets, the southern of which is the largest. In the channel between this latter islet, and the mud bank at the entrance of the river the depth is only 9 feet. Between the south Tsang islet and the one next it to the northward, there a is channel of 4 fathoms water close to the latter; and inside the two central islands the depth is 3 fathoms, but the space is confined.

NAMKI ISLANDS lie N.E. by N. 30 miles from the Tae group, and on the south-eastern side of the largest, 740 feet above the sea, there is a good harbour called port Namki. Vessels should not pass among the islets forming the south-west part of this group, as there are many reefs which cover at high water. The westernmost islet, Turret, makes like a cone and has reefs to the north and west of it. The southern islet, Castellated rock, lies S.S.W. 5 miles from the rest of the group.

Anchorages.—In the N.E. monsoon and with S.E. winds a swell rolls into port Namki. There is a bay on the north side of the west point of Namki which the junks frequent and which is a good smooth water anchorage.*

Water.—Good water can be obtained in port Namki.

PIH-KI-SHAN ISLANDS.—N.N.E. 9 miles from Namki is another group, the largest island of which is named Pih-ki-shan. The four islets close to its south-east side, protect the anchorage on its south side from the easterly swell. Vessels should not, however, choose this anchorage, unless from necessity. Fresh water may be obtained.

TUNG-PWAN and TAE-PIH ISLANDS.—W. ½ N. 11 miles from Pih-ki-shan, with five small islets intervening, is another group of one island and four islets. The island, called Tung-pwan or Brass basin, has anchorage off its south-west face in 8 fathoms in the N.E. monsoon, but the shelter is not so good as that on the south side of the Tae-pih islands, lying 3 miles to the N.W. of it, under which the water will be smooth in 4 fathoms.†

* Lieutenant Alfred Eaton, R.N., H.M.S. *Firm.*

† *See* Admiralty Charts:—East Coast of China, Sheet 7, No. 1,759; scale, $m = 0{\cdot}24$ of an inch, and No. 1,763.

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In working up to the northward of the Tae-pih and Tung-pwan groups, shoal water will be found to extend 8 miles from the foot of the hills on the main; at which distance is the 2 fathoms' line of soundings. On the eastern edge of this line, at 6½ miles northward of Tae-pih, is the Pang-peto reef, visible at low water; from it the western of the Tae-pih islands bears S.S.W. ½ W., and the southern of the Tseigh islands E. by S. ½ S.

TIDES.—At the Namki and Pih-ki-shan islands it is high water, full and change, at 8h. 30m., and springs rise 17 feet. At the anchorage under the southern side of the latter group, the ebb came from the N.N.W., the flood from the S.E. by E.

TONG-WHANG GROUP.—The Tseigh islands, three in number, named North Tseigh, South Tseigh, and East Tseigh, 8 miles N.N.W. of Pih-ki-shan, lie on the south of a large and numerous group. Between the Tseigh and Pwan-peen island, the next island northward, is a navigable channel for vessels of over 3 cables wide. Tong-whang, the largest island of the group, the summit of which is 730 feet high, is 6 miles long E.N.E. and W.S.W., $2\frac{8}{10}$ miles at its extreme breadth, and its eastern face is high and precipitous; there is a junk channel between it and Pwan-peen.

Coin island, the eastern of the Tong-whang group, has three rocks lying N.W. of it, and to the W.S.W. is a low flat islet, named Flask, with rocks off its southern end, and two rocky islets to the north-westward, between which there is a safe channel of 8 fathoms water.

Rock.—A rock having 2¾ fathoms over it at low-water springs lies with the summit of Coin island N.N.E. ¾ E., distant $2\frac{3}{10}$ miles, and the summit of Takew island W. ½ S., southerly, 7 $\frac{3}{10}$ miles.

Mosquito Rock.—Lying N.N.E. 7 cables from the northernmost of the two rocky islets N.W. of Flask island is a pinnacle with 4 feet over it at low-water spring tides, and 7 to 8 fathoms around. From it the summit of Coin island bears S. 73° E.; north point of Tong-whang N. 15° W. and its S.E. point S. 35° W. Between this danger and the northern rocky islet the ground is foul.

BULLOCK HARBOUR, the entrance to which is between the Tseigh group and a high island with bold cliffs, named Takew, has excellent anchorage in 4 to 10 fathoms, sheltered from all winds except those from South to S.W. by S. which bring in a heavy southerly swell. The distance is 2 miles between the Tseigh and Takew islands, and on entering a vessel will have to pass over a bar of 4 fathoms water, deepening to 6 and 8 fathoms, and then shallowing to 4 and 3 fathoms at the head of the

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harbour. The anchorage is in 5½ fathoms off the west end of Pwan-peen island.*

Alluding to this harbour Captain Napier remarks:—"A more sheltered anchorage for a single vessel with steam power will, however, be found to the north-westward of Snell island, or west of Stony island (at the southern entrance of the San-pwan pass). H.M.S. *Nassau* rode out a very heavy typhoon on July 30th, and 31st, 1878, with perfect security, in 8 fathoms water (mud). From her position the summit of Snell island bore S. 52° E. North island bore south; and the islet off the N.W. point of Takew S. 25° W."

Supplies.—Water can be obtained in this harbour; fowls and eggs; bullocks are also procurable, but neither plentiful, nor large.

TIDES.—It is high water, full and change, in Bullock harbour at 8h. 30m., springs rise 17 feet. A ship approaching Bullock harbour from the southward will be set over towards Takew considerably by the ebb tide and towards the south point of Miaow by the flood.

DIRECTIONS.—Vessels have no business in the space between the Pih-ki-shan and the Tseigh islands, as the cluster of rocks there are interspersed with reefs covered at half-tide. If bound to Bullock harbour from the southward pass between Tung-pwan island and Shroud islet, which latter may be recognised by its bluff; the islands near it are low. Care must be taken to avoid a sunken rock lying North of the rocks immediately westward of Shroud; and also the reef North of the islet lying N.N.W. 2½ miles from Shroud. The reef south-east of Shroud island is reported to extend some distance to the south-eastward, requiring caution when passing between it and the Pih-ki-shan group.†

MIAOW ISLAND‡ is 4 miles long by about 1½ miles broad, the summit 1,082 feet high; lies 4¼ miles south of Hutau point. There is a remarkable boulder on the summit of a hill 855 feet high, rather more than half a mile to the south-westward of Miaow summit.

There are two islands off the south-west point of Miaow island, the larger of which is called Seaou-ne-ce-san, and the smaller one Whang-chau.

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* It is stated by Navigating Lieutenant Barns, R.N., who was cruizing in these parts in 1866, that several of the names on the chart have been wrongly inserted or misapplied. For instance, Tung-pwan is not known to the Chinese by that name, but one of the Tae-pih group is so called. The natives call the Pih-ki-shan islands Pah-ki, Bittern island Pih-ki-shan and Great Sanpwan island Chwang pien. In the river Min, Wou-fou island is properly Lowgai, and Pinnacle island the true Wou-fou.

† Navigating Lieutenant J. W. Dixon, 1877.

‡ *See* Admiralty Charts, Nos. 1,759 and 1,763, of Pih-ki-shan to the Hie-shan islands, and of Wên-chau river and approaches; also Hydrographic Notice No. 15 of 1878, and China Sea Directory, vol. iii., 1874.

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Seaou-ne-ee-san is table-topped, with a slight rise at its eastern end, and is 98 feet high. A cluster of rocks, awash at high water, lies 2 cables to the south-westward of it. Cat point is a mound, 550 feet high, joined to Miaow by a low piece of land which is cultivated. The south-east point of Miaow is also a mound, 257 feet high, and somewhat similar in appearance to Cat point. To the northward of this mound is a bay, near the centre of which is a small point which breaks its continuity. This point, when in line with Miaow peak, is one of the turning marks for Sanpwan pass.

Dick Islet is small, peaked, 43 feet high, and situated to the northward of Miaow island.

GREAT SANPWAN ISLAND, 3¾ miles long by rather more than 1¼ miles broad, lying to the north-eastward of Miaow island, is low at its south-west end, and gradually rises to an elevation of 771 feet, called the Paps, on account of there being two mounds at the summit close together, which are conspicuous from east and west. To the north-eastward of the Paps the land is high and hilly, with numerous smooth-topped hills ravines, and valleys.

Between Miaow and Great San-pwan islands are two islets; the west one is connected with Miaow by a ledge of rocks and sand, but between the east one and Great San-pwan island a channel exists, which is greatly used by boats and small junks, but the 8-feet bank to the northward precludes its use by larger craft. To the southward of the east islet a ledge of rocks runs off about half a cable.

TAKEW ISLAND is a high bold island 711 feet high, cliffy on the north, east, and south-east sides; off its north-west side the 2-fathom line extends three-quarters of a mile. Here also, at one cable from the shore, is a small detached rock 29 feet high; and another rock (North islet) 23 feet high, ½ a cable from the north point.

Cutting and Snell Islands, 190 and 217 feet high, lying N. by E. from the summit of Takew, one mile, and 1½ miles distant, form the northern and southern boundaries of the two ship channels leading to the south entrance to San-pwan Pass, from the eastward.

Stoney Islet consist of a cluster of large stones 21 feet high; off its south-west end are some rocks which dry 3 feet.

MIDDLE ISLAND is 309 feet high, with a remarkable steep cliff on its north-east side and a conspicuous mound on its summit. Off its east end there is a small detached portion 42 feet high, and on its southern face there is a small sand bay.

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Camp Rocks consist of a cluster of rocks 32 feet high, with a rocky ledge off the west extreme. To the southward of Camp rocks is an islet 38 feet high.

Tides.—It is high water, full and change, at Camp rocks at 9h. 16m. Springs rise 20 feet; neaps 15 feet. The flood tide sets in at both ends of the San-pwan pass; duration 5¼ hours, maximum rate 1¾ knots. The ebb runs out at both ends; duration 7¼ hours, rate from 1½ to 2 knots.

Steep Rock is connected to Middle island by a rocky ledge, and is 101 feet high. A quarter of a mile to the south-west is a rocky ledge which dries 10 feet at low water.

LITTLE SAN-PWAN ISLAND is hilly; its summit is 286 feet high, and it is 1¾ miles long by three-quarters of a mile broad. Off its north-east and west points there are rocky ledges, the latter of which dries 16 feet and is steep-to. During the south-west monsoon good anchorage can be obtained on its north side. There is a narrow boat channel between it and Tong-whang with an islet 40 feet high in the centre.

SAN-PWAN PASS.—Directions.—Coming from the southward, pass Takew at a convenient distance, and steer so as to bring the Paps in line with a small yellow sand bay, just to the westward of Tail point, N. 36 E.

Steer with this mark on till Miaow summit is in line with the small point in the bay north of the south-east point of Miaow, N. 65 W., when steer with the summit of Middle island in line with the centre of the small bay on the south side of Middle island, N. 53 E. This mark must be very carefully attended to, as the objects are so close. When Dick islet is just seen through False pass, N. 64 W., an E.N.E. course should be steered, and when East cliff island is seen between Middle island and the detached lump off its eastern end, N. 47 E., steer as requisite out of the pass.

A ship bound from Bullock harbour through the San-pwan pass has choice of two good channels, one between Tong-whang and Snell island, and the other between Takew and Cutting island, after which follow the directions given for San-pwan pass.

A vessel drawing 13 feet can take the Sanpwan pass at low-water spring tides, and a vessel drawing 16 feet can take it at neaps.

Tides.—The first of the flood sets through the channels north of Takew island at a maximum rate of from 1½ to 2 knots. The last of the flood sets straight up Bullock harbour. The ebb sets S.S.E. at a maximum rate of from 1¾ to 2¼ knots. Flood and ebb have about equal duration of 6¼ hours.

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Tidal Streams.—If passing outside Tong-whang island, guard against the flood setting in the direction of W.N.W.

Going up the Ou-kiang the streams will be found to run with the direction of the channel, and therefore there is not much danger of being swept out of the course.

Off Hutau point, however, the first of the ebb sets E. by S., and running swiftly, has to be guarded against.

At the turn from flood to ebb, the set gradually changes through north.

At the turn from ebb to flood, the same occurs through south.

Slack water is only momentary.

There are violent eddies off Salamis point.

Above Salamis point and up to Snipe island anchorage, the tides are up and down channel. Nearly all the creeks and canals dry at low water.

The overfalls at low tide over the shallow banks between Hutau and Wên-chau point are dangerous for boats if there is any breeze.

In taking a boat up to Wên-chau-fu, advantage may be taken, if more than half flood, of the creek or channel inside Chitu island, passing by the foot of Fort hill. At lesser periods of the tide, however, the strict ship channel must be kept.

Fishing stakes are, as a rule, in the deepest water of their locality.

Twin Rocks lie N.E. by N. and S.W. by S., from one another distant 1½ cables; the northern one dries 5 feet at low-water springs, and the southern one 6 feet at the same time of tide. From the northern of these rocks—

Hokeen summit bears	-	-	N. 16° E.
Miaow „	-	-	S. 63° W.
Gt. San-pwan „ (the Paps)	-	-	N. 87° E.

SPLIT ROCK is a remarkable, steep, jagged, dark brown rock, inaccessible on the south-east face, 129 feet high at the north-east end, and 112 feet high at the south-west end, which is sharp. At a distance this rock appears to be slit near the centre, but such is not the case, as the higher portions are connected.

Small Islet, lying 4½ cables south-westward from Split rock, is a small, brown, rocky islet, 30 feet high. A channel exists between Split rocks and Small islet, carrying a depth of 25 to 30 fathoms.

Chow-chow water is plentiful between Small islet and the shore of Great San-pwan island, but no signs of shoal water were found.

HOKEEN ISLAND is a remarkable-looking island, rising to an elevation of 726 feet. On the north, west, and east sides, the land rises gradually from the different points in long spurs till nearly half-way up, then it rises abruptly to the summit, the sides being rocky and steep. On

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the south side the ascent is more gradual, and south of the summit are two peaks of less elevation.

There is a small white joss-house on the south-west point of the island.*

To the northward of Hokeen island, and joined to it, is a rock which dries 17 feet, and from it a rocky spit extends half a mile to the northward, the least water on which is 9 feet.

Little Hokeen, off the east side of Hokeen island, rises gradually from the eastward to an elevation of 150 feet; off its east end is a ledge of rocks which extends one cable.

Between Hokeen island and Little Hokeen there is a cluster of rocks, which dries 13 feet.

Scrag islet is a small but remarkable islet (with 6 peaks, the highest of which is 48 feet high), lying a quarter of a mile to the south-eastward of Hokeen; some rocks lie off its south side.

HUTAU ISLAND is 6 miles long by about 3 broad, and mountainous, having two round summits, one near to its west extreme (mount Myers) 1,238 feet high, and the other near to its centre (mount Warren, 1,255 feet high. Stone peak is about half a mile to the southward of mount Warren, and is very remarkable, rising abruptly to an elevation of 1,140 feet; it has a large stone on its summit. Square peak does not appear of a square shape until bearing about N.N.W., when it begins to assume that aspect, which when bearing north is very marked. Between the two summits of Hutau island there are several peaks, two of which appear sharp from certain positions, the eastern one from south to S.E., and the western one from the southward. The sides of the hills present a terraced appearance, owing to the natives cultivating the land in terraces, one above the other.

From East point to Rock point the coast is bold and cliffy; about halfway between are some black jagged rocks under the cliffs, and half a mile to the westward of them is a small indent, with a remarkable cliff with a fissure, just to the eastward, which, in line with Square peak, forms one of the river leading marks.

Off Rock point is a rock joined to the shore which dries 15 feet; to the eastward of this point is a bay where shelter may be obtained for boats under some rocks at its east extreme. There is a rock in this bay which dries 9 feet.

The bay at the east end of Hutau island affords shelter for boats and small junks during the north-east monsoon, but a heavy swell sets in. There is a rock in this bay which dries 10 feet.

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* This joss-house was painted white by H.M.S. *Nassau*, and forms one of the river leading marks.

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Near the centre of Hutau island is an extensive bay which dries nearly a mile from its head, and off the west end of Hutau island is a small bluff island 42 feet high.

North bank, lying between Hutau island and Wên-chau point, is composed of hard sand, which dries 6 feet, and is 2¼ miles long at low water spring tides.

South bank, situated about 2 miles southward of Hutau island also consists of hard sand, which dries 4 feet, and is 1¾ miles in length at low water spring tides.

Between North and South banks are four small banks which dry.

White rock, lying to the southward of Hutau island, and 6 cables west of Rock point, is peaked and stony, 138 feet high, with a small portion detached to the southward. There is good anchorage west of White rock, bottom mud.

Tides.—At the north-east end of White rock the mark of mean water level is cut.

It is high water, full and change, at White rock at 9h. 53m. Springs rise 22 feet, and neaps 15 feet.

The flood stream sets at a maximum rate of 2 knots; the ebb 2½ knots. After passing White rock the water changes from clear and salt to muddy and brackish.

Hutau bank.—The shoal part of this bank lies half a mile S.S.W. of White rock, and dries at low water spring tides.

Junk island has a ruined square building on its summit which appears like a fort.

Wên-chau point may be recognised from the entrance of the river by an isolated range of hills 412 feet high, with three distinct summits. The eastern one has a ruined fort, and the centre one a mound on its top. There is a small walled town at the west extreme of the range, and just outside it are three small chimneys.

A ledge of rocks extends off Tent point, and dries 9 feet at low water.

The same terraced appearance exists here as at Hutau island.

Tides.—The duration of the flood stream off Wên-chau point is 5½ hours, and maximum rate 3¼ knots; that of ebb 6 hours, and the rate 4½ knots.

Wên-chau island,* 2¾ miles long by 1¾ miles broad, is low, flat, and highly cultivated, and surrounded by a sea wall; there are numerous

* The shores of Wên-chau, Snipe, and Big islands are extending, the natives reclaiming the land wherever practicable and profitable.

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villages on it. Off the extreme west point is a small knob 108 feet high, and just to the eastward of it, but on the island, is a table-topped green lump 99 feet high. About half a mile to the eastward of this green lump is Wên-chau lump, 133 feet high, which is round topped, with several red sand spots showing through the grass. These lumps are very conspicuous from the entrance of the river.

At a distance of half a cable off the south side of the detached western lump is a rock which dries 2 feet.

Tides.—It is high water, full and change, at Knob point, Wên-chau island at 10h. Springs rise about 20, and neaps 17 feet.

The ebb stream through the channel south of Wên-chau island attains a velocity of about 5 knots. Both flood and ebb streams continue to run for about 25 minutes after high and low water by the shore.

A mud flat, consisting of soft mud, extends 7½ miles in a south-easterly direction from Wên-chau island. Off its south-east end is a sand bank three-quarters of a mile long.

There is a small junk anchorage off Wên-chau lump.

Between Wên-chau island and the mainland to the southward there is a junk channel, and in it an extensive bank of sand and mud, which dries as much as 16 feet at low water.

Brown hills consist of a smooth, round topped, isolated range of hills, the summits of which are 596 and 510 feet high. To the west of Brown hills, and contiguous, is a range of reddish hills, of less elevation than Brown hills, the summits being 374 and 328 feet high.

White lump is 199 feet high, and nearly one mile from the bank of the river, with several trees growing on its summit.

Inner lump, 274 feet high, and of greater extent than White lump, lies 1½ miles from the bank of the river, has several trees on its summit, and a dark appearance.

House hill is a dark round mountain of sugar-loaf shape, 1,669 feet high, with a small house (apparently a joss house) on its summit.

ROCKY POINT is a small rocky lump, steep-to, with a white joss-house surrounded by trees; and 2 cables westward is another small lump with several trees on it.

There are two batteries, one to the eastward of Rocky point, and another to the westward of the west lump.

Inside Rocky point is a large walled town, surrounded by a canal.

Between Wên-chau point and Rocky point the land is low, flat, highly cultivated, and fronted by a sea wall. There are numerous villages in this space.

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To the westward of Rocky point west lump, the land presents the same appearance, until arrested by a high range of mountains, at the extreme end of which is a fort with three chimneys close to.

Salamis point, which is steep-to, may be easily recognised by its two white forts. To the eastward of Salamis point the land trends away to the south-east, and is low, flat, highly cultivated, and fronted by a sea wall. At three-quarters of a mile inside the sea wall is Elephant range, 957 feet high. There is a remarkable knob on this range, 716 feet high. Off Salamis point is a bank which narrows the channel to 1½ cables. To the south-westward of Elephant range there are most extensive ranges of high mountains.

Cone peak (which is amongst these mountains) is, as its name implies, cone topped, and most remarkable; it is 1,547 feet high.

Between Salamis and Jar points the land is again low and flat. There are two forts in this space.

Jar point is bold and steep-to, 241 feet high. The three chimneys mentioned in previous sailing directions do not exist, and the Jar is so far inland that it cannot be seen from the river.

Snipe and Big islands are low, flat, and highly cultivated, surrounded by a sea wall, and interspersed with numerous trees and houses.

Lower or Snipe island anchorage.—The village stands on the right bank of the river above Jar point, and the land from Jar point to the extent of the *Nassau's* survey is low, flat, and highly cultivated, generally fronted by a sea wall, and containing numerous houses and villages. This highly cultivated land extends for some one to 3 miles to the southward, when it is terminated by high mountain ranges. There are two forts at the village.

The Customs flag-staff is in latitude 27°58′20″ N.; longitude 120°45′39″ E. There is a canal connecting the village with Wên-chau-fu.*

Anchorage.—Vessels can anchor between the eastern pier and the point at the west end of the village; it is advisable to moor.

Tides.—It is high water, full and change, at Snipe island at 10h. 15m. Springs rise 22¾ feet; neaps rise 17 feet.

Wreck.—The hulk *Waterwitch*, now a total wreck, lies about 2 cables off the south-west point of Big island.

DIRECTIONS.†—After passing Tungpwan or Tae-pih islands, if not intending to enter the Ou-kiang by the Sanpwan pass, steer for Bullock

* The custom house and flag-staff have been burnt down, and no steps are being taken to replace them.—Navigating Sub-Lieutenant F. Lancelot, H.M.S. *Moorhen*, 1880.

† Some alteration appears to have taken place (since the *Nassau's* survey) in the banks of the Ou-kiang (or Wan-chu river), especially in the North channel.—Remark book of H.M.S. *Lily*, 1881.

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harbour, and pass between Pwan-peen and Tseigh islands; after which pass between the two islets which lie N. 29 W. from the west point of Flask island, distant from each other 7 cables;* steer then as necessary for Split rock, which may be passed on either side, and thence for Rock point, Hutau, taking care to clear the rocky spit off Hokeen island.

North Channel.—To enter by this channel, pass White rock at one cable's distance, and when the highest part of Rock point is in line with the gap in White rock N. 82 E. steer with it on this bearing till a white joss-house on the south-west point of Hokeen comes in line with the left-hand gap in the hills north of "Paps" on Great Sanpwan island S. 68 E.; keep this bearing on till Small island is seen just clearing the north-east point of Hokeen island S. 76 E. (at this position the west point of Hutau island is in line with the shoulder of the most northern hill visible on Hutau N. 63 E.). Steer with Small island seen just clear of the north-east point of Hokeen, till House hill comes in line with the left extreme of the walled village on Wên-chau point N. 47 W., then steer on this bearing.

When approaching Wên-chau point, a course should be steered to keep about 2 cables off the left bank of the river until nearing Rocky point, when bring Cone peak in line with the west fort on Salamis point S. 59 W.; steer for Salamis point on this bearing, and pass the point at a distance of three-quarters of a cable, taking care to avoid a strong eddy always found to the eastward of Salamis point on the flood.

From thence steer for Jar point and anchor as convenient.

South Channel.†—If intending to enter by the south channel bring Square peak in line with the cliff on Crack point N. 28 E.; steer with this bearing on till Small islet comes in line with the north-east end of Hokeen island, when steer for Dick islet on a S. 48 W. course, and when Split rock is shut in by the north-east end of Hokeen, port the helm gradually; when S.E. Cliff island is open its breadth of the north-east point of Hokeen N. 87 E., steer on this bearing, till the white joss house on the S.W. point of Hokeen is in line with the left-hand gap in the hills north of "Paps" on Great Sanpwan island S. 68 E. (at which time Dick islet will be in line with the remarkable boulder on Miaow S. 36 W.), and then follow the directions given for the north channel.

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* 6½ cables N.N.E. from the western islet is a rock with 4 feet over it at low water spring tides.

† Navigating Lieutenant F. Lancelot remarks that "the marks for the Wan chu river are very easily recognised, except Dick island, which is difficult to make out, being so low, and close under the high land of Miaow; but when steering for it on a S.W. ¼ W. bearing there is a red joss house just to the westward of the island, which will serve as a guide.—Remark book, H.M.S. *Moorhen*, 1880.

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The Ou-kiang can be safely navigated by vessels of 14 feet draught at low water spring tides, as far as Snipe island, using the south channel, and vessels drawing 10 feet can use the north channel, *but this latter is not recommended.* There is, however, sufficient tidal change in this river to accommodate steamers of the deepest draught at half flood.

Anchorage.—The bottom of the Ou-kiang is chiefly composed of mud and sand, the banks being hard sand. The holding ground will be found good at all the anchorages. If intending to anchor off Wên-chau-fu, it should be remembered that the drains of that city empty themselves to the eastward, and vessels should anchor above these and westward of the Customs flag-staff.

Tides.—In the river, off Wên-chau city, the average duration of flood tide was observed to be 4¾ hours; that of ebb 7¼ hours. During freshets, however, the ebb sometimes runs for a whole day at a rate of about 6 knots. Both streams continue to run for 38 minutes after high or low water. In the months of May, June, and July, after heavy rains, freshets may be expected.

Between Tent point and Mark point (Wên-chau point) is an extensive mud flat, adapted for grounding small vessels and gunboats between tides.

Fishing stakes abound in the river; they are more numerous in August and September than in other months. Some of these are sufficiently large to injure the propeller of a steamer, but the majority are harmless.

Beacons.—Between Snipe I^{d}. and the City the following Beacons have been erected to indicate the best water at the various crossings.

1st Crossing.—On right bank of river 1¾ miles westward of Snipe I^{d}. anchorage. 1. A pole 36 feet high, with square black frame. 2. A pole 26 feet high, with pyramidal black frame. These two kept in line, should indicate the best channel for crossing to the S.W. point of Chi-tu-t'u (or Big Island).

2nd Crossing.—On western end of Big I^{d}. Two similar poles with *red* frames, these kept in line, should indicate the best channel between Big and Chitu islands.

3rd Crossing.—Near N.W. end of Chi-tu I^{d}. Two poles precisely similar to those at 1st Crossing. Kept in line they should indicate the best channel between Chi-tu I^{d}. and the left (northern) bank of the rvier.

4th Crossing.—On the left bank of the river close westward to Chiang-to. Two poles precisely similar to those at second crossing. These beacons kept in line should indicate the best channel between the northern bank of the river and the city.

There are no pilots to be obtained at Wên-chau; but by previous application to the consul a Chinaman can be procured to meet the ship.—Navigating Sub-Lieutenant's Remark book, H.M.S. *Lily*, 1881.

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Elephant rock beacon.—A beacon, consisting of an iron mast painted *red*, surmounted by a basket, (also *red* with white band) is placed on the small pinnacle rock in Wên-chau harbour, known as Elephant rock. This rock is submerged 8 feet at high water spring tides.

Defences.*—Beyond a few old forts and guns scattered along the banks of the river, there is not much attempt at defensive works. The city of Wên-chau-fu and its suburbs are said to be capable of producing, on occasion, about 3,000 armed men, but these would be chiefly militia.

Supplies.—Kelung coal can sometimes be obtained in limited quantities at Wên-chau-fu, but it is of indifferent quality; the price is from eight to ten dollars per ton. Firewood is two dollars per fathom. Good fresh water can be obtained from "Two Pagoda point." Supplies of fish, fowls, eggs, beef, pork, and geese may be procured at moderate prices. Vegetables are cheap and plentiful, and consist of water melon native-grown grapes, pine apples, pumpkins, potatoes, and yams.

Winds.—Sea breezes set in regularly during the summer months in the river; they are generally felt at the city between 2 and 4 p.m. Thunder-storms are frequent at this season; they occur between 4 and 8 p.m., working round from the northern hills, crossing the river, and returning by the south. In 1877, during March and April, the weather was constantly thick and foggy; these months were also very rainy. Mirage is common in the river. Typhoons are frequent, besides the very severe one of July 1878, there were no less than three during the year 1881.

Typhoon anchorages.—Bullock harbour and the anchorages west of Tong Whang island afford fair shelter, also that south of Hokeen.

Temperature and range for 11 months in the years 1877-1878:—

Mean height—Bar.		Ther.	Mean height—Bar.		Ther.
April	29·90	70·8	October	30·19	70·0
May	29·92	71·9	November	30·25	62·5
June	29·85	77·8	December	30·21	54·4
July	29·75	82·4	January	30·63	42·6
August	29·83	82·2	February	30·30	44·6
September	30·02	76·1			

Mean for 11 months, barometer 30·08 inches; thermometer 66·8 degrees.

* In the village at Snipe island are two new forts, indifferently built, but mounting really efficient guns, though of an old pattern.

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OU-KIANG (Wên-chau river).—**General remarks.**—The length of this river from White rock to its source at the city of Hung-Chuen (Dragon spring) is about 180 miles, viz., to Wên-chau-fu 30 miles, and to source 150 miles. It is navigable for junks with a carrying capacity of about 20 tons as far as Wên-chi. Its general direction from the city of Wên-chau-fu to that of "Chu-chow" (distant some 90 miles by water) is north-west; from thence to its source south-west. The tide has no force beyond the town of "Wên-chi," which is 30 miles beyond Wên-chau-fu.

WÊN-CHAU-FU.—This city was founded and its wall built about 374 A.D., tradition asserting that the site was chosen on four hills because of a superstition connecting these with four stars in the constellation of "Ursa Major." Subsequent to the building of the wall, 28 wells were sunk to correspond with the 28 constellations in the heavens. Wên-chau-fu is a prefecturial city (or one of the first class, entitled to the title "Fu"). The Prefect has jurisdiction over six other cities of the second and third class.*

Population.—The native population is estimated at from 100,000 to 200,000;† there were also 23 Europeans resident at Wên-chau in 1878.

Government.—The city is governed by a civil governor (Too-tai); there is also a military governor or "Chen-tai."

Currency.—The currency of Wên-chau is chop dollars by weight, and copper cash.

Postal communication.—There is a Chinese post overland to Ningpo, and thence by steamer. There is also a Chinese Government courier to Ningpo, starting weekly and traversing the distance in 4½ days; the mail thus carried is forwarded on by steamer in 12 hours to Shanghai. There is also return communication.

Trade.—The new treaty port of Wên-chau has not yet shown signs of much commercial activity, but there can be little doubt that, with sufficient enterprise and direct intercourse with the great inland marts, this port should assume importance in connection with the foreign tea trade. Tea-growing districts abound in the neighbourhood, the majority of which are to the south-west. The transit of this and other produce is by canal,

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* Wên-chau was one of the ports named in Sir R. Alcock's Convention. Its value to foreign trade can only be tested by experience; but the information regarding it shows it to be a place of considerable business. Its speciality is likely to be tea, and it will probably take away something in this respect from the trade of Fu-chau. It will tap the northern extremity of the Wu-i (or Bohea) district, as Fu-chau does the south and centre.—London and China Telegraph, 11th December 1876.

† Lieutenant von Riche, of the German Imperial Navy, gives the number at 50,000. *See* Annalen der Hydrographic, Heft. II., 1878.

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by which means it can be brought direct to Snipe island or Lower anchorage.

Exports are tea, opium (native grown), rice, charcoal, planks, bamboos, building spars, &c., and the district is rich in iron and alum.

Imports are salt fish, sugar, and cotton, by junks.

In 1882, 79 vessels entered and cleared the port of Wên-chau of an aggregate tonnage of 25,820 tons. The total trade for that year amounting in value to 132,424*l.*

Medical Notes.*—The prevailing diseases of Wên-chau are cholera, ague (from the country districts), ophthalmia, small-pox, enthetic disease. The town from the number of its priests, nuns, and temples has been christened the "cathedral city." Cases of opium poisoning are frequent. Elephantiasis is met with. Leprosy is very rare. Though the diseases before alluded to exist, they are confined to the native population, and the city may be considered generally healthy for a Chinese town. The best season of the year, from a sanitary point of view, is during the months of December, January, and February, and the most unhealthy June and July.

Captain R. H. Napier, R.N., makes the following observations relative to a case of Asiatic cholera that broke out on board H.M.S. *Nassau* in August 1878, when anchored off the city of Wen-chau.

"In August 1878, an outbreak of Asiatic cholera occurred at Wên-chau, the rate of mortality being from 30 to 40 per day. The *Nassau* had one very severe case. On the suggestion of Dr. Myers (medical officer of Customs) the dry heat system was resorted to (though the man was apparently past all hope of recovery); steam having been raised, the patient was placed close to the boilers in a temperature of 120° (F.) which was gradually lowered to about 98°. The marvellous effect of this treatment was immediately seen, two or three hours sufficing to place the man out of all danger; this was no isolated case of the cure of Asiatic cholera in China by this means, for Captain Cocker of the Imperial Chinese Customs, also used it with perfect success, and the facts cannot be too strongly impressed on those who may have the misfortune to have a portion of their crew seized with this most terrible scourge."†

Quarantine.—The medical officer of Customs reports any suspected vessel, and the pilot is ordered to anchor such vessel one mile below the shipping, at the Lower anchorage.

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* From reports and observations of Dr. Myers, medical officer of Customs, 1878.

† During the campaign in Scinde, when the mortality from cholera was very high, the late Sir Charles Napier stated that the most wonderful cures were effected by frequent draughts of cold water.

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LOT-SIN BAY.*—Junk island, lying on the north side of Hutau, is low and rocky, and the channel between them, and between Junk island and the main, can only be used by small junks.

North of Junk is Lot-sin bay, which runs back to the northward 20 miles, in the southern parts of which there is good anchorage, but the head of the bay is shoal, except a narrow outlet to the sea between Ta-ou island and the main named Hebe Lock.

QUANG-TA ISLAND.—At 2 miles eastward of Hutau is Quang-ta island, under the west side of which H.M. Brig *Plover* anchored, but the water was found to shoal very suddenly. There is a channel between Quang-ta and the Cliff rocks to the S.E., and also between Quang-ta and Ta-ou to the north; but the islets and rocks off the north-east part of Quang-ta being but partially surveyed, ought to be avoided.

KEMONG HARBOUR.—Westward of the east point of Ta-ou is a bight named Kemong harbour, (with an islet off each point,) in which the junks are fond of taking shelter. It is, however, confined, and vessels will have better anchorage to the eastward under either Taluk or Seoluk islands.

Rock.—Captain Meier, of the Hamburgh barque *Kingman*, reports† the existence of a rock, lying awash in the middle of the entrance to Kemong harbour. From the rock, (which was only seen twice) one or two feet above water, during the three weeks the vessels remained in the harbour; the east extreme of the rocks extending from the north-eastward point of Quang-ta bore South, and the east point of Nam-pan off its western point of entrance, S.W. Before the arrival of the *Kingman* no European vessel had brought a cargo to this port. The Chinese knew of the existence of the rock.

SEOLUK, TALUK, CHIN-KI, TOWAN, and PE-SHAN, ISLANDS form a group off the coast from 3 to 14 miles eastward of Ta-ou. Taluk the centre and highest of the group, 770 feet above the sea, is 30 miles N.N.E. of Pih-ki-shan. West of Taluk is Chin-ki, a low flat island with a large village on it; there is anchorage between these in 3 to 4 fathoms. The bay to the north-west of Chin-ki is shoal, and at its head is the entrance to Hebe Lock communicating with Lot-sin bay. At 8 cables north-east of Chin-ki is Towan island, with a channel of 4 fathoms water between them; but as there is a sunken rock in the middle of this channel, and a reef runs out from the north point of Chin-ki, vessels have no business here. Between Towan and the rocks off the north end of Taluk the passage is a mile wide.

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* There is a walled town in Lot-sin bay.—Captain Edmond, P. & O. Steamer *Orissa*.

† Nautical Magazine, page 277, May 1860.

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The Seoluk islets, consisting of three, lying north and south of each other, are 1½ miles southward of Taluk, and in the channel between them the depth is 7 to 8 fathoms.*†

Pe-shan, the easternmost of this group, is 1½ miles long, east and west, and off its northern face are three rocks, and off its southern two islets. W. by N. 1½ miles from Pe-shan is a low level islet, named Flare island, and 1½ miles north of Flare is Sugar Loaf island, with a small islet close to its north side. Between Sugar Loaf and Flare the depth is 5 fathoms.

TIDES.—At the anchorage between the islands of Chin-ki and Taluk it is high water, full and change, at 9h. 20m., springs rise 13 feet.

TAOW-PUNG ISLAND, at 9 miles N.N.E. of Pe-shan, is 7 miles long N.N.E. and S.S.W., and 1½ miles broad, and forms the east side of Yeyvan bay, which is shoal and affords no shelter. The island is separated from the main by Penetration pass, a narrow channel through which all the country trade passes. Near the north end of the pass, on the main, is the walled town of Song-men.

At 2½ and 3 miles respectively to the south-west of Song-men point, the south end of Taow-pung, are two flat rocks above water, a mile apart. To the south-eastward of the point are three islets, and the nearest, named San-shi, has a reef off its west side; the outer islet of the three has a shoal off its north end. There is a navigable channel, a mile broad, between San-shi and the rocks off the point. At 3 miles north-eastward of San-shi, are the Stragglers and Shetung islets; the northern and highest islet of the latter group, has a reef lying 3 cables from its south-west point, and many rocky islets off its south end, between which and the Stragglers there is a channel carrying a depth of 6 fathoms. Indifferent shelter in the N.E. monsoon may be found under Shetung.

Between Shetung and Taow-pung island are two islets forming three channels, the eastern of which, between Shetung and the next islet westward, has 3¼ fathoms in it, but the other two are too narrow for vessels. Junks lie inside the inner islet, where there is a small village.

* To the N.W. of North Seoluk Island the water is shoal, and vessels using the passage between that Taluk should borrow on the northern shore, giving Seoluk a wide berth; as little as 25 feet was got by H.M.S. *Magpie* in 1881, on the 4th day after full moon, at ¾ ebb. There is also probably as little as 3 fathoms on the straight course for Sugar Loaf island after passing Taluk; as the *Magpie* got 24 feet at ¾ ebb on the same occasion.—Remarks by Captain Napier, H.M.S. *Magpie*, 1881.

† Mr. W. O. Thorburn, R.N., states that on passing between Taluk and Chin-ki islands on the 17th of February 1882, at nearly low water, one day before change of moon, the depth of water (by the soundings taken) was found to have decreased. With the centre of Taluk island bearing East about one mile distant, several casts of 2 fathoms were obtained.—Derived from the Remark Book of Sub-Lieut. W. O. Thorburn, H.M.S. *Sheldrake*, 1882.

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To the north-east of these two islets are three rocks above water, the northern of which has a reef off its east end. Soudan, the easternmost islet of the group, is flat-topped, and has a reef off its south side.

CHIKHOK ISLANDS.—Chikhok island lies North 6 miles from Soudan, and as it rises abruptly in a cone to the height of 760 feet above the sea, and has a broad yellow stripe on its south-eastern side, it forms altogether one of the best landmarks in this locality ; and S.W. by W. ½ W. of it is the most conspicuous hill on the coast seen from the offing. N.N.W. 1¼ miles from Chikhok is Low Chikhok island with a half tide rock lying N.W. 3 cables from it. West 2 miles from Chikhok is Crookback island, with many rocks about it, of which those which extend to the eastward narrow the channel between it and Chikhok to one mile. The *Plover* anchored to the south-west of Crookback in 2¾ fathoms, but a long swell sets in here, and the channel to the northward of it is too shallow to get through on that side. The same may be said of all the channels amongst the many islands to the north-west of Chikhok.

TAI-CHAU ISLANDS.—E. ½ N., distant 9½ miles from Chikhok, is Hea-chu islet, the southernmost of the Tai-chau group, having off its south side a remarkable finger rock. This island has a conspicuous yellow streak down its south-east side. This streak is quite as conspicuous as that of Chikhok, which lies 10 miles to the westward. The group extends 9 miles northward of Hea-chu, and consists of two large and ten smaller islands. Between the two large islands is an excellent harbour, the approaches to which, both from eastward and westward, are free from danger. The southern of these islands, 750 feet high, is called Hea-ta, the northern Shang-ta, which is well inhabited. Between Shang-ta and the Shang rock, 1¾ miles to the N.N.E., there is a safe passage.

About 2 miles southward of the west point of Hea-ta are two rocks, the western of which lies S.S.W. 3¼ miles from the highest part of Hea-ta and shows at all times of tide ; the other, which bears N.E. ½ N. 4½ cables from the western rock, and S. by W. ¾ W. from the highest part of Hea-ta, covers at high water.

Water.—Several watering places will be found on Shang-ta, but the supply from any one of them is not abundant.

Anchorage.—The best anchorage in the harbour between the two large islands of the Tai-chau group, during the N.E. monsoon, is to the south-east of the islets, extending from the south-west point of Shang-ta.

TIDES.—It is high water, full and change, at this anchorage at 9h. 0m., springs rise 14 feet.

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SQUALL ISLANDS,* two in number, the southernmost of the Tungchuh group, lie 6 miles N.W. by W. of Shang rock, the northern islet of the Tai-chau group, and so close together as to appear as one except on an E.N.E. and W.S.W. bearing. Rocks lie off the north-east and north-west points of the northern island, and a reef extends from the south-east end of the southern island. Junks take shelter under the western point of the southern island during strong north-east winds.

Crate island is a small cliff islet 2½ miles eastward of the Squall islands, and the channel between has 8 fathoms in it; but the western end of Crate is not steep-to. A group of rocks lie 3 miles W. by N. of Squall.

CHUH-SEU ISLAND, lying N. by W. ½ W., 4½ miles from the Squall islands, is remarkable, having a sharp cone, 670 feet above the sea, over its southern point, and a beacon on its western summit. Between Chuh-seu and the Squall islands are four rocks; and S.E. by E. ⅓ E. 2¾ miles from the highest part of Chuh-seu is a solitary rock named Fir Cone.

TAI-CHAU BAY and RIVER. — Tai-chau bay, to the N.W. by W. of the Tai-chau islands, is wide and shallow, and at its head is the entrance to the Tai-chau river, 17 miles west of the cone of Chuh-seu. On the south bank of the river is the walled town of Haimun, 4 miles above which the river separates into two branches, one taking a north-west, the other a south-west direction. The city of Tai-chau fu is on the north branch of the river, about 24 miles in a direct line from Haimun. There are only 8 feet at low water across the bay to the entrance of the river, but inside the headlands at the entrance the depths are 4½ and 5 fathoms. The inhabitants reported that vessels of 12 feet draught could not cross the bar, except at high water, and that the tide, which rises from 18 to 20 feet in this locality at springs, would carry them up to the city.

The southern shore of Tai-chau bay is fronted by a chain of islands extending towards Song-men, most of which are connected with the shore at low water. The outer and north-eastern of these is the North Foreland, an islet 9 miles W.S.W. of the Squall islands, and which has a depth of 10 feet inside it. South of it are two other islets, and S.S.E. 2 miles from it is a half-tide rock from which Chikhok, 8 miles S.S.E., is in line with Low Chikhok. The water decreases gradually from Squall islands towards the head of Tai-chau bay, but by not bringing the North Foreland eastward of South, a vessel will have 2½ fathoms at low water.

The channel between Chuh-seu and Mud islet (a hill on the mud on the north side of Tai-chau bay) is shallow, with several rocks in it covered at

* More dangers are reported to exist between Squall island and Gau-tau island than charted, great caution is therefore needed when navigating those parts.—Derived from remarks by Navigating Lieutenant J. W. Dixon, R.N., H.M.S. *Nassau*, 1877.

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high water. North 1⅓ miles from the western islet lying off the Chuh-seu group is a rock showing at low water.

Anchorage and Water.—Good anchorage and a convenient watering place, with abundance of water, will be found under and to the south-west of the cone of Chuh-seu in 6 fathoms, between it and an islet with a reef off its north-east point.

TUNG-CHUH ISLAND.—East, a little northerly, 5 miles from Chuh-seu is Tung-chuh or Bella Vista island, 700 feet high, the eastern-most of this group. The two Reef islands lie S.S.W. 2¼ miles from its south point; a reef extends north-easterly from the southernmost of the two. Midway between Reef and Chuh-seu is a cluster of rocks.

Gau-tau island, remarkable for four barren peaks, lies 3 miles north-west of Tung-chuh, and the channel between them has not been examined; there is generally a heavy swell in it. The low north-eastern promontory of Gau-tau is an island at high water; and there is a half-tide rock 3 cables North of its north-east extreme.

Anchorage.—Shelter may be had in the N.E. monsoon under the south side of Tung-chuh, but there is generally a heavy swell, which renders riding there unpleasant, and vessels had better gain the anchorage under Chuh-seu, or endeavour to reach Barren bay.

BARREN BAY, formed between Gau-tau and Kin-men islands, is 2¼ miles wide at its north-eastern entrance, and besides the half-tide rock just noticed off the eastern promontory of Gau-tau, there are rocks off the eastern point of Kin-men, and a mud spit off the north-west point of Gau-tau. Immediately to the south-west of Kin-men, and separated by a deep-water channel rather more than a cable across, is Nine Pin island, divided near the centre by a sandy isthmus, on which is the rock from which the island is named. Very poor shelter will be found between Gau-tau and Nine Pin in 6 to 3 fathoms, the deeper water being towards the latter. In taking the Barren bay channel from the southward, after passing Fir Cone, Nine Pin island should be steered for, and the Kin-men island shore kept close aboard, as the west side of Gau-tau island is shoal.

There is a channel westward of Nine Pin, but it cannot be recommended, as there are depths of 1¾ and 2 fathoms to the northward of Nine Pin, and between it and Pine Cone, an islet lying N.W. 2½ miles from it. South 2 cables from the west end of Nine Pin, is a rock which will be seen at half-tide.

Rock.—A rock just awash, situated on the south-east side of Nine Pin island, was observed by the officers of H.M.S. *Kestrel*, when passing at 2 hours before high water.

The following bearings were taken from the ship when half a cable south of the rock: east point of Nine Pin island, N. ¾ E.; south extreme of west Nine Pin island, W. ½ S.; south-east extreme of Kin-men island, N.E. ½ E.

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These bearings place the rock about 2 cables from the east side of Nine Pin island.*

FALL and CHAIN ISLANDS.—Fall island, lying nearly 2 miles northward of Kin-men, has off its west end two rocks above and one below water. The channel is safe between these islands, and also between Fall and Chain islands, but the latter are not steep-to.†

Chain islands, three in number, bear N.W. by W. 4½ miles from Fall island. South 2 cables from the centre island is a half-tide rock; and there is a rock awash and two small islets lying off the west end of the southern island. Between Chain and Pine Cone to the southward are four detached rocks where the ground has not been examined.

Caution.—Vessels should keep eastward of the whole group just described, for the space inside Chuh-seu, Kin-men, Chain, and Sanmun islands is shallow, and has in it several rocks covered at high water.

HIESHAN GROUP,‡ consisting of three inhabited islands and eight rocks, lie N.E. by E. ½ E. 17 miles from Tung-chuh, and occupy a space 5 miles north and south, and 2 miles east and west, but they are too small and too detached to afford shelter. The southernmost island, 320 feet above the sea, is the largest, and makes like a saddle. The inhabitants, who are Fu-kyen men (and most likely pirates), call the islands Ung-shan; they are all fishermen, and excellent fish may be obtained.

The rocks are steep, with remarkable cliffs. The sea has so much undermined the northernmost islet, named Mushroom, as to cause it to bear some resemblance to a large mushroom. N.E. ⅔ E. 1¾ miles from Mushroom is a sunken rock, of 8 feet water, from which the Cheng rock appears in one with the south-east end of Cliff or Sha-ho island, bearing S.S.W. ½ W. A quarter of a mile N.N.W. from Mushroom is a rock awash at low water.

MONTAGU ISLAND, or Tanto-shan, 19 miles N.N.W. ½ W. of the Hieshan group, is separated from the islands off the mainland by channels varying from 1 to 1¾ miles wide, the navigation of which is much obstructed by sunken rocks. There is good anchorage in the bay on the south side of Montagu island, but the depths have decreased since the

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* Information by Navigating Lieutenant C. A. Morshead, H.M.S. *Kestrel*, 1881. *See* Admiralty Charts:—China, Sheet 7, eastern coast from the Pih-ki-shan to the Hie-Shan islands, No. 1,759; Sheet 8, Hie-Shan islands to the Yangtze-Kiang, No. 1,199.

† *See* Admiralty Chart:—East Coast of China, Sheet 8, No. 1,199, scale, $m = 0{\cdot}25$ of an inch.

‡ *See* Admiralty Charts:—China, eastern coast, Sheet 8; Hieshan isles to Yang-Tse-Kiang, No. 1,199, and plan of San-Moon bay, No. 1,994.

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survey of 1843 ; the bottom is even and consists of mud. The island is 740 feet high, and nearly divided into two parts, the connection being a low shingly isthmus ; the northern portion is called Gore island. There is a detached islet off the south-east point.

To the southward of Montagu, and at 2 to 4 miles from the eastern coast of the large island of Nyew-tew, are five islets ; the two southernmost called the Twins, are 8 miles from Montagu island.

Startle island, viewed from a short distance, appears like two islands. Both ends are high, but the northern is the larger and higher of the two.

Ellis island, situated 4 miles south of Montagu island, has a rock lying about 2 cables from its north-west end.

Nose islet, which is nearly connected with the east coast of Nyew-Tew island, has a reef of rocks extending from it in an easterly direction, for a distance of 2 cables.

HEROINE ROCK.*—Is small, dries 4 feet at low water springs, and has depths of 5½ to 7 fathoms close around. From this rock the summit of East Twin bears E. by N. ¾ N., Cape Conway, N.N.W. ½ W., and small islet near west end of Leaming island, N.W. by W. ¾ W. This position of Heroine rock confirms that assigned to it by Commander E. O. Matthews, U.S.S. *Ashuelot*, 1875.

SAN-MUN BAY entrance is 20 miles W.N.W. of the Hieshan islands, and it will be readily recognised by a remarkable thumb peak, 800 feet above the sea, called by the Chinese Tafou, and by the opium vessels Albert peak ; it rises from the northern end of Tafou island, on the northern side of the bay.

Vessels wishing to stop at tide or driven in by bad weather, will find good shelter in the N.E monsoon immediately westward of Lea-ming island, which forms the north point of entrance of the bay. In running for this anchorage, give a berth of 2 cables to the south-west point of the island, to avoid a reef lying off it. The soundings will shoal suddenly after the north peak of the island is brought southward of East ; the bottom is soft mud.†

S.W. ⅜ S. 2½ miles from Lea-ming, is Sanchesan or Triple island, and the depth between them is 10 and 11 fathoms. West, 6 miles from Leaming is a conical islet, named Cone island, with a reef off its south end ; and N.W. by N. 6 cables from Cone is a small islet with a rock off its south-east face. At 4 miles westward of Cone is a small islet lying in the fairway of the river.

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* Examined by boats of H.M.S. *Magpie*, 1881.

† *See* Admiralty Plan of San-mun bay and Sheipoo harbour, No. 1,994, scale, $m = 0{\cdot}7$ of an inch.

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Having passed southward of Cone, St. George island will be seen bearing N.W. by N. 4 miles; the water shoals gradually as this island is approached, and the anchorage in 3 fathoms at half a mile South of it is secure in N.E. winds. There is a well of good water on this island, but it is not easily got at nor plentiful.

The bay or inlet northward of St. George is shoal and full of rocks; it extends a considerable distance, leaving an isthmus 7 miles wide between it and Nimrod sound. At 4 miles N.N.E. of St. George is the entrance of a passage, communicating with the sea through Sheipoo harbour, which is frequently used by the junks.

Ning-hau River.—Westward of St. George island is a group of high islands, the largest of which is called Tinwan. There are several islets and rocks on the eastern face of this group, and between their western face and the main is the deep water channel of the Ning-hau river, a mile wide. S.W. from Tinwan is the embouchure of a smaller river, on the bar of which are only 4 feet, but with deep water inside. On the left bank of the latter, 5 miles from Tinwan, is the walled town of Kien-tyau. Between Kien-tyau and Tau-tew point, opposite and west of Tinwan, the hills rise abruptly from the coast-line to the height of 1,000 feet; but shallow water extends above a mile from the shore.

Passing mid-channel between Tinwan and Tau-tew point, a W. by N. ½ N. course will lead up to the entrance of the Ning-hau, which is 6 miles above Tinwan, and to the south of Quarry island, where there is good anchorage in 6 and 4 fathoms; a mud spit extends 2 miles eastward from Quarry island.

TIDES.—At the anchorage under St. George island, San-mun bay, it is high water, full and change, at 10h. 20m.; and the springs rise about 15 feet.

SHEIPOO ROAD.*†—Vessels bound to the roadstead off the town of Sheipoo may pass close to the northward of the islets off Gore island, the northern portion of Montagu island, and steer to the westward for the two forts on the summit of Tungmun island. On the north side of the roadstead are the three Bangao islands, and South 3 cables from the eastern point of the centre one, Wangchi, are the Bangao rocks, which always show. There is deep water close to these rocks, except to the westward, where it shoals to 2¼ fathoms; to avoid which do not bring the higher fort to the southward of West.

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* *See* Admiralty Plan of San-moon bay and Sheipoo harbour, No. 1,994; scale, $m = 0{\cdot}7$ of an inch.

† Caution is necessary in entering Sheipoo roadstead and harbour, as the water has shoaled since the last survey.—Derived from the Remark book of G. W. Balliston, Navigating Lieutenant H.M.S. *Vigilant*, 1875.

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Cliff island, or Seao-Seao, lying nearly in the centre of the roadstead, has anchorage off its north-west end in 4 fathoms, but with a strong wind a considerable swell rolls in. A reef of rocks extends westerly from Cliff, and the channel between it and the islands off the main has 3 fathoms water. South of Cliff is an islet with foul ground between, and S.S.E. 6 cables from its east point is a sunken rock. There is a narrow channel between this danger and the shoal ground extending from Montagu and Gore islands, the extremity of which is marked by a flat rock with a sunken rock 2½ cables N.W. of it. This latter is 5 cables E. by S. of Cliff.

SHEIPOO HARBOUR* is between the mainland and Nyew-tew island, and at high water has the appearance of a splendid basin, but when the tide is out the mud dries off shore a long distance, giving it the appearance of a river. At its western end is an entrance into San-mun bay, and on its south shore there is another leading into the bay west of Lea-ming island, which is very narrow. The town of Sheipoo stands on the main forming the northern boundary of the harbour near the sea, and derives its importance principally as a convenient stopping place for the coasting trade; the walls are in a dilapidated state, and the houses and shops are not good.

There are three very narrow entrances, with rapid tides and chow-chow water in them, leading from Sheipoo road into Sheipoo harbour. Two of these entrances are formed by Tungmun island. In the centre of the middle entrance between Tungmun and Sin island, and just within it, is a rock on which H.M.S. *Sphinx* struck in 1853. It lies in the narrowest part of the channel, and the least water on it was 10 feet, with irregular soundings around, the deepest water being towards Sin island; it appeared very small, and is probably quite smooth. This passage is not recommended for large vessels, and if used they should keep well over on the south shore.

The northern entrance between Tungmun and the main, although tortuous and narrow, is safe; there is also less chow-chow water than in the middle entrance. There is only 10 feet of water on the tail of the shoal on the east side of this entrance. The south entrance, between Sin and Nyew-tew, is long and narrow, and near its mouth is a small flat islet with a reef extending eastward from it. Vessels pass north-eastward of this islet; but it is said the Chinese junk-men never use it, and they report rocks in mid-channel.

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* Caution is necessary in entering Sheipoo roadstead and harbour, as the water has shoaled since the last survey.—Derived from the Remark book of G. W. Balliston, Navigating Lieutenant H.M.S. *Vigilant*, 1875.

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The COAST from Sheipoo trends northerly about 25 miles to the entrance of Nimrod sound, and is fronted by several islets, none of which are large enough to afford shelter, and the depths about them generally are under 3 fathoms.

HALF-TIDE ROCK lies N.E. ¾ N. 5¾ miles from the east point of Montagu, with the Bear (an islet near the main with a sharp peak at its western end but not always easily made out) bearing N.W. ½ N., distant 11 miles. Should high tides and smooth water prevent this rock being seen, the east point of Montagu kept westward of S.W. will lead to the eastward.

Cliff islands, lying W. by N. ½ N. 5½ miles from Half-tide rock, consist of three rocky islands (besides small rocks); and N. by E. ½ E. 1¾ miles from the east point of the easternmost of these is a *rock*, which dries 5 feet. From this rock Half-tide rock bears S.E. by E. distant 5 miles.

KWESHAN ISLANDS are eleven in number, besides several rocks. The central and largest island is 3 miles long, and deeply indented, and its greatest breadth is 1¼ miles; in two places, however, it is not much more than a cable across. Near its western end the land rises to a sharp peak 490 feet high; its coast line is steep, high cliffs broken by six small sandy bays, and the island is steep-to on all but its western side. The other islands are much smaller. The whole group is thickly populated, the inhabitants subsisting principally on fish; they have pigs, goats, a few fowls, and sweet potatoes.

Patahecock, the south-easternmost island of the group, is 450 feet above the sea, and remarkable on account of its flat and table-like appearance. It has a detached rock off its southern end, separated by a deep narrow cleft remarkable when seen from the E.N.E. In the cleft is a sharp pinnacle about 15 feet high. In hazy weather this may serve to identify a vessel's position. The easternmost islet off Patahecock is about 50 feet high and round at the top.

The north-eastern island of the group is a narrow cliff islet uninhabited; to the westward are four small islets inhabited and cultivated; and North of them, at the distance of 3 cables, is a flat precipitous rock, the coloured appearance of which (it being composed of red porphyry) renders it remarkable. This face of the islands is free from danger, the depth being 7 or 8 fathoms near the shore.

The north-western island of the group is the second in size and 400 feet high; its northern extreme is remarkable, in consequence of several isolated masses of rock. The peak of the largest island bears South of the north-west island, and between the two is a mud bank gradually shoaling toward

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the larger island. By keeping the west extreme of the north-west island to the eastward of N.N.E., not less than 3 fathoms will be found with good holding ground, and not much swell.

South of the peak of Kweshan, and separated from the island by a channel 1½ cables wide, is another island which is also high with steep cliffs; off its western point is a half-tide rock, and a reef runs off from its south end. The Holderness rock lies W. ¼ N. one mile from the highest part of this latter island, and having only 6 feet water over it, occasionally breaks; from it the highest part of north-west island bears N.N.E. ¼ E.; a small peaked islet to the south-east, S.E. ⅔ E.; and Patahecock table E.S.E., the reef of rocks lying off the south end of the nearest island being in line with it. Another sunken rock with only 4 feet on it lies S. by W. ¾ W., three-quarters of a mile from the summit of the same island; when upon it the east end of the large Kweshan is in one with the east end of the nearest island, bearing N.E. ½ E., and Patahecock table E. by S. ¾ S.

Between the Kweshan group and Bear islet to the westward, the depths vary from 6 to 3½ fathoms, gradually shoaling towards the latter.

TIDES.—It is high water, full and change, in the neighbourhood of the Kweshan islands at 9h. 30m., springs rise about 14 feet.

The change in the direction of the stream does not take place until two hours subsequent to the change of depth. The flood stream comes from the southward at the rate of about 2 knots per hour, and will sensibly assist a vessel in getting into the Chusan archipelago. Between the Hieshan and the Kweshan islands the flood against a strong northerly wind causes an angry sea. The ebb stream out of San-mun bay will be useful in working to windward, provided the vessel heads up to the northward of N.N.W.

MOUSE ISLET, WHELPS, and STARBOARD JACK ROCKS.

Mouse islet, situated N.N.W. 5 miles from the north-east extreme of Kweshan islands, is of a dark colour, 20 feet high, and can be seen at a distance of 5 miles. At 1½ cables N.W. ¾ N. from this islet lies a rock which covers at half tide.

The Whelps, about 100 feet high, a cluster of four small islets, bear W.N.W. 10 miles from the same extreme.

Starboard Jack rocks, 30 feet high, bearing N.W. ¼ W. 9½ miles from N.E. Kweshan, are easily distinguished by their black appearance.

PYLADES ROCK, awash at low water springs, lies 3½ miles S.S.W. ½ W. from the Whelps. From this rock the summit of Mesan

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island is seen between the Whelps, bearing N.E. by N., Castle rock in line with Buffalo Nose (summit) N. ¼ W., and Thornton Peak W. ½ S.

A rock is reported to exist between Kweshan islands and Bear island, about 5 miles south of Pylades rock.

The CORKERS are several isolated rocky patches, 3 miles in extent, and well above water, lying between the Whelps and Buffalo Nose, an island 6 miles to the N.N.W. From the outer or eastern rock, which is occasionally covered, Buffalo Nose bears N.N.W. ¾ W.; there are two islets one cable to the westward of it, which will point out its position if the rock should be covered. The distance between the Corkers and Starboard Jack is about 3 miles, and the channel between has depths of 6 to 5 fathoms.

BUFFALO NOSE CHANNEL.—The Tinker is a steep cliff rock, 80 feet high, lying N. by E. ½ E. 2¾ miles from Starboard Jack. The Buffalo Nose Channel, the entrance of which is between them, has 6 and 7 fathoms in it, and will be found the most eligible to take in entering the archipelago during the N.E. monsoon, as the vessel will be well to windward. There is a sunken rock off the Tinker S.E. by E. 2 cables from it.

MESAN ISLAND.—Mesan, the largest of a group of four large and several smaller islets or rocks, lies at three-quarters of a mile N.N.E. of the Tinker; it is about 400 feet high, its barren summit forming one of the most remarkable features in the Buffalo Nose channel. There are 7 and 8 fathoms water between it and the Tinker, but sunken rocks extend a short distance from both shores. Lanyett is the next island N.N.W. of Mesan.

HARBOUR ROUSE.—At 3 miles E.N.E. of the Mesan group is Front island, the southernmost of a chain of islets extending N.N.E. 3½ miles to Beak island. Between Front island and a castellated rock two miles to the westward, is the entrance to Harbour Rouse, which will be found a convenient stopping place in the northern monsoon for a vessel that has missed her tide through the Beak Head channel; the depth in the harbour varies from 5½ to 2½ fathoms.*

BUFFALO NOSE ISLAND, lying N.W. ½ W. 16 miles from the north-east extreme of the Kweshan islands, and six from Starboard Jack, is 1¼ miles long north and south, and three-quarters of a mile broad. Its eastern shore is rocky, and an islet lies off its north-west end; its western side has several deep indentations, one of which nearly separates

* The existence of a half-tide rock bearing west from the S.W. extreme of Front island, distant about ½ a mile; has been reported by Mr. Smith, a Ning-po pilot. (Approximate lat. 29° 37′ 30″ N., and longitude 122° 12′ 45″ E.).—Remark book of Sub-Lieut. W. O. Thorburn, H.M.S. *Sheldrake*, 1882.

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the island into two parts. There are three peaks on the island, the central one, 500 feet above the sea, being the highest. Near its northern end the island is perforated, from whence its native name (Niupi-shan) is supposed to be derived.

Anchorage.—The anchorage westward of Buffalo Nose is secure; during the N.E. monsoon, however, the wind blows directly through and occasional violent squalls are experienced.

Supplies.—Fresh provisions and water may be obtained at this anchorage, but the supply of the latter cannot be depended upon.

PLOUGHMAN GROUP is composed of three islets, of which the largest lies W.N.W. nearly a mile from Buffalo Nose, the depth between them varying from 5 to 18 fathoms. The largest is an even flat-topped islet with a reef extending from its north-east point; there is also a detached reef at 6 cables N.W. by N. from the same point. The other two islets are narrow and small, and lie to the north-west of the large one.

Junks usually pass inside the Ploughman and Buffalo Nose, and to the westward of the Corkers; there are, however, many reefs, and the tides are strong, and vessels will do better to keep eastward of Buffalo Nose. As before noticed (page 363), the channel between the Tinker and Starboard Jack is the best to take during the N.E. monsoon, and a vessel will have better anchorage under Luhwang than under Buffalo Nose.

NIMROD SOUND.*—Six miles W.N.W. of Buffalo Nose is the entrance of Nimrod sound, a deep inlet of the coast running 27 miles inland in a W.S.W. direction. Within the south point of entrance are the Hunters, a group of six islands, and 3 miles N.W. by N. of these, on the opposite side of the channel, which carries 5 to 6 fathoms, is the Castle rock on the edge of the mudflat, which extends $2\frac{1}{4}$ miles from the north shore, and which commences at Barren island $5\frac{1}{2}$ miles above.

Castle rock may be passed at 4 cables; the other islands and banks of the sound are for the most part steep-to. Between Nimrod point on the south shore, 7 miles above the Hunters, and Barren island, the sound is $2\frac{1}{2}$ miles wide. Between Nimrod point and the Hunter islands is First Cone point, with an islet off it; and westward of this latter point is Cone rock and David island, with a half-tide rock lying one cable north-west of the latter. Nimrod point is high, and has several sunken rocks lying 3 cables off it. Four miles above it is an islet, which, from its central position, is called Middle island; and southward of this islet is the entrance to Medusa creek, of 4 to 6 fathoms water.

* *See* Admiralty Plan of Nimrod sound, No. 1,583, scale, $m = 0{\cdot}7$ of an inch.

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Above Medusa creek the sound is narrowed, between the south shore and Parker island, to three-quarters of a mile, the water is deep, and the tides strong. Off the east end of this island, at 4 cables, are the Danger rocks which are steep-to and only show at half-tide. S.S.W., 1½ miles from Parker island, is the entrance of a small river for boats, leading up to a village 3 or 4 miles inland, having about 6 feet in it at low tide.

At 7 miles above Medusa creek the sound is separated into two branches by the Treble islands. Pass northward of these islands, keeping in mid-channel to avoid the Half-tide rock 3 cables from the north shore.

In the shallow bight on the north shore, to the north-west of the Treble islands, is the village of Tung-ju, from whence there is a paved footpath communicating with the Fungwha branch of the Ningpo river, the distance from hence to Ningpo being 20 miles in a direct line. On the south side of the sound, at 3 miles south-west of the Treble islands, is also a paved footpath leading to San-mun bay. Having passed the Treble islands good anchorage will be found in 6 or 7 fathoms, mud, off the village of Tung-ju.

TIDES.—It is high water, full and change, in Nimrod sound at 10h. 30m., springs rise about 20 feet.

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CHAPTER VII.

EAST COAST OF CHINA.—NIMROD SOUND TO THE YANG-TSE KIANG,

INCLUDING THE CHUSAN ARCHIPELAGO, NINGPO, HANG-CHU BAY, AND THE APPROACHES TO THE YANG-TSÉ KIANG FROM THE SOUTHWARD.

VARIATION 2° 0′ West, to 2° 30′ W. in 1884.

CHUSAN ARCHIPELAGO.*—This large assemblage of islands, of which Chusan is the principal, lies near the mainland between the parallels of 29° 39′ and 30° 50′ N. The archipelago may be entered from the southward by four channels named the Buffalo Nose, the Beak Head, the Vernon, and the Sarah Galley, of which the two former channels may be considered the best to enter by, and the Vernon to go to sea. Northward of Chusan, the second channel between Chin-san island and the chain of islands extending westward from Video, is generally taken if bound to Ning-po and Chusan during the N.E. monsoon, being clear of danger with the exception of the Mariner reef at its western entrance. The water of the archipelago is very muddy, and causes the boilers of steamers to prime.

LUHWANG, the largest of the islands in the south-west part of the archipelago, is 9½ miles long N.W. and S.E., and 6 miles wide at its broadest part, which is the western end; near the centre it is not more than 2 miles across, and not much elevated above the sea. The south-eastern body of the island rises to the height of 865 feet, being a conical bare hill; on the isthmus is an isolated peak 718 feet high, and on the north-west side of the island are five high peaks, one of which is 910 feet high. The western part of the island, forming the eastern side of Duffield pass, has several small bays with stone embankments extending from point to point. Cape Luhwang, the north extreme of the island, is high and bold. The island is well cultivated and maintains a large population.

The southern face of Luhwang has two small deep indentations with sandy bays, and a reef projects 3 cables from the point abreast the Mesan

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* *See* Admiralty Charts :—East coast of China, Sheet 8, No. 1,199, scale, $m = 0{\cdot}25$ of an inch; and Chusan Archipelago, South Sheet, No. 1,429, scale, $m = 0{\cdot}8$ of an inch.

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and Lanyett group, described on page 363. Reefs also extend half a mile from the north extreme of the latter group, narrowing the channel between them and Luhwang to less than a mile. The coast line of Luhwang immediately westward of the reef point trends to the north-west, forming a wide bay with three islets in it, extending to Duffield pass. South one mile from the easternmost islet is a mud bank, of 3¼ fathoms water, which extends to Mesan, to avoid which a vessel may keep the islet aboard; a rock lies half a cable from its south extreme. Duffield reef lies off the western extremity of Luhwang at the eastern side of the entrance to Duffield pass, and consists of three rocks above water with a sunken rock between them and Luhwang.

Anchorage.—There is good holding ground in 9 to 5 fathoms on the south-west side of Luhwang outside the line of these islets and Duffield reef point. Within this line the soundings are irregular from 2½ to 4 fathoms.

FU-TO ISLAND, to the westward of Luhwang, is about 2½ miles long, north and south, and a mile broad, and its narrow south extreme is connected at low water to St. Andrew island, a bold steep head. A spit runs off the north extreme of Fu-to, and to the north-east are three islets, with a rock one cable to the north-west of Chloe island, the northernmost.

Tree-a-top island is 3½ cables southward of the south extreme of Fu-to, with a deep water channel between. This island, 180 feet high and about 4 cables in circumference, has a pile of stones on its summit, *but no tree;* the old name, however, given it in the chart by Thornton in 1703 is still adhered to.

DUFFIELD PASS, the nearest but not the best channel in, is between Luhwang and Fu-to, and is 1¼ miles wide at the southern entrance (where the water suddenly deepens from 5½ to 40 fathoms), and half a mile in the narrowest part, which is near the centre. On the Fu-to shore are several islets; among them the water shoals to 4½ and 5 fathoms, and a vessel may anchor and stop a tide if necessary. Off the fourth point on the Luhwang side is a reef extending a cable from the shore; otherwise this side of Luhwang is very steep-to, the depth being 35 fathoms within a cable of the mud. Two small islets, named the Notches, lie in the centre of the pass, abreast this reef, and between them and Fu-to is a half-tide rock; unless this rock shows, vessels should not tack inside the Notches so as to pass westward of them.

Young Hebe rock, with only 16 feet over it, lies 2 cables eastward of Hebe island at the north end of the pass, with the north extremes of Hebe and Chloe islets in one bearing N.W. by W. and Point Barrow, the

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east extreme of Fu-to in one with the west extreme of Tree-a-top island, seen over the mud connecting St. Andrew with Fu-to. On the Luhwang side, north-east from Hebe island, and a cable from the shore, is Bird rock, which formerly had a stone pillar on it, but it was either thrown down or removed in 1846; there are two islets at 2 cables southward of it; beyond the rock the coast-line of Luhwang turns suddenly to the north-east to Cape Luhwang.

GOUGH PASS, formed between Fu-to and the Central islands, is 1½ miles long, half a mile wide, and far preferable either to Duffield or Roberts pass, for both shores are steep-to, and the lead, if hove quickly, will give warning of approach to the shoal extending half a mile S.S.W. from the southern islet of the Central islands.

The south-western of the Central islands is a small islet connected at low water with the largest of the group by a reef and spit. At half a cable north of the northern island is a reef.

ROBERTS PASS, between the Central islands and the mud which dries one mile from the embankment on Mei-shan island, is 2 miles long, N.E. and S.W., and 4 cables wide; the depths in it vary from 6 to 40 fathoms, but as the lead gives no warning, its boundary on the Mei-shan side will not be known except at low water. Mei-shan island appears formerly to have been eight islands, now, however, united by substantial stone walls, one of which, on its north face, is 1½ miles in extent. The mud dries 1½ miles from its south, and a quarter of a mile from its north end; on its east side the bank is steep-to.

On the north-east side of Mei-shan, are the two Damson islets, from the northernmost of which, Cliff islet, a bank of 3 fathoms extends nearly a mile to the north-east. By keeping the Central islands open of the Damson islets until the vessel is three-quarters of a mile past Cliff islet, this bank will be avoided, and the Ketau shore can then be approached. The course for Ketau point, after clearing this pass and Gough pass will be N.E. 9½ miles.

JUNK CHANNEL, between Mei-shan and the Ketau shore, is 10 miles in length and 2¼ cables wide, and carries a depth of 5 and 6 fathoms except at the south entrance, where it shoals to 10 feet; some parts, however, may be deeper, as only one line of soundings was taken across the bar. On the mainland, near the centre of this channel, is a custom-house, and the entrance to a canal which communicates with two populous villages. Two miles northward of Mei-shan is the walled town of Kwokeu, where the mate of the *Lyra*, merchant ship, was kidnapped, and attempts made to interrupt the surveying operations in 1840.

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Anchorage will be found anywhere along the Ketau shore, between Mei-shan and Ketau point, until abreast of Sing-lo-san island, where the water deepens.

CAUTION.—As there is no anchorage besides the above, but in very deep water, until that (page 380) under Elephant island is reached, it would not be prudent for sailing vessels to proceed farther unless the wind and tide will ensure their gaining that position.

TIDES.—In the above passes the first of the flood often comes from the northward, and runs sometimes for three hours before it takes the direction of the ocean tide.

BEAK HEAD CHANNEL (Taou-sau-mun of the Chinese), the next passage north-east of Buffalo Nose channel, is considered one of the best by which to enter the archipelago from the southward. Its eastern entrance is $2\frac{3}{4}$ miles wide, between Beak head, the east extreme of Beak island, and Vernon point, the east end of Vernon island. Beak island is nearly 5 miles long, in some parts very narrow, and remarkable for two hummocks near its west end. Off Beak head are three islets; and south-westward of the head are several islets and a rock, between which and Luhwang island is Harbour Rouse (page 363), which will be found a convenient stopping place for a vessel that has missed her tide through Beak head channel. The channel between Luhwang and Beak island has $3\frac{1}{2}$ fathoms least water; but there would be no object in using it while there are passages so superior.

Off the north-east face of Beak island are two reefs, lying respectively 3 cables and half a cable from the shore. Off the north face are Gull, Shag, and Puffin islands; a reef also extends 3 cables from the north-west end of Puffin. Near the west end of Beak island the channel is narrowed to half a mile by the reef of rocks, extending from between Gull and Shag half-way across the channel, the northernmost of which is always above water, and also by two small islets lying off the south side of Conical hill island, which lies between Shag and Vernon. Between Conical hill island and Vernon are two islets, the reefs off which render the channel between these islands intricate.

DIRECTIONS.—A N.W. by W. $\frac{1}{4}$ W. course for $8\frac{1}{2}$ miles from the eastern entrance of Beak head channel will lead southward of Conical hill and Conway islands, and from thence a N.W. course will clear the channel; take care, however, in light winds to give the Pai rock, the last islet on the north side of the channel at its western entrance, a wide berth, as the flood sets directly towards it. There is good anchorage in 9 and 10 fathoms on the north-west side of Conway.

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To the northward of Conway island is a group of islets and rocks, through which there is a passage into the Vernon channel; but owing to the rapidity of the tides, it should not be attempted without local experience. On the Luhwang side of Beak Head channel is a reef, and an islet with a small pinnacle on it; the reef, which is generally uncovered, bears S.E. $\frac{3}{4}$ S. 2 miles from Cape Luhwang, and by keeping the cape westward of N.W. $\frac{1}{2}$ N. it will be avoided. The mud dries 7 cables from the Luhwang shore, in the bight to the southward of this reef, which makes landing difficult except at high water.

VERNON CHANNEL (Hea-che-mun of the Chinese), the next channel northward of the Beak Head, is formed by Vernon island on the south and Taou-hwa island on the north. This will be found a convenient passage from Chusan during the northern monsoon, the distance from Elephant island, off Tinghae harbour, to the open sea being only 17 miles; it should not, however, be attempted by sailing vessels with light winds, as they are liable to be becalmed and experience flaws under the high land of Taou-hwa, and in some parts the soundings are 60 fathoms, and the tides strong.*

The Vernon channel at its eastern entrance is $1\frac{1}{2}$ miles wide, but 5 miles within it is divided into two passages by John Peak island, which has a rock, lying half a cable from its north-east extreme, which uncovers at the last quarter ebb. The passage between John Peak and Taou-hwa is only $3\frac{1}{2}$ cables wide between this rock and two small islets and some rocks which bound its north side. The passage between John Peak and Vernon† is half a mile wide, and good anchorage will be found on the south side of John Peak. The shore of Taou-hwa is bold and precipitous, and the peak of the island is elevated 1,680 feet above the sea. Near its western end the land becomes low, rising, however, again, and surmounted by a peculiar perpendicular crag, called Miller's Thumb, 606 feet high, which will be recognised nearly throughout this part of the archipelago.

Anchorage.—Vernon island has on its north-east side a wide bay, with two islets and a reef in it, where vessels may anchor in 4 and 5 fathoms, and procure water from the several cascades on Taou-wah

* Taou-hwa is most conspicuous. We made the land in very hazy weather which obscured all the lower land, but this peak showed the position and enabled me to recognise the entrance of the Vernon Channel. On entering the channel the muddy water caused the boilers to prime, causing a loss of speed; and at times we were unable to make headway against the stream.—Remark Book of Capt. Wm. Gore Jones, R.N., H.M.S. *Princess Royal*.

† In July, and perhaps some other months, beware of fishing stakes west of Peak island; they are always in deep water.

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island ; the water may be obtained without removing the casks from the boats. The east end of Vernon is rugged, with large boulders of granite ; at this end there is a cove, which runs back three-quarters of a mile to the westward and affords shelter for boats.

SARAH GALLEY CHANNEL is the next passage northward of the Vernon, but it is by no means so eligible as those just described. Near the entrance, at 4 miles N.E. by E. $\frac{3}{4}$ E. from the south point of Taou-hwa island, is the Jansen or Laoush rock, a steep cliff islet, with rocks extending $1\frac{1}{2}$ cables from its south end; there is also a half-tide rock lying W. by N. $\frac{3}{4}$ N., $1\frac{1}{4}$ miles from the north extreme of Laoush, with the highest part of Ousha island bearing N.N.E. $\frac{1}{4}$ E. $1\frac{3}{4}$ miles.

The coast line of Ousha is steep cliffs, and off its north-west end is a ledge of rocks ; the southern end of the island is the highest, and rises in a *round peak*. The channel between the north-east point of Taou-hwa and Peak island is not navigable, owing to reefs and strong tides ; neither is there a fit passage between Peak island and Tang-fau. Vessels may pass between Peak island and the two patches of rock lying westward of Ousha ; but there are some rocks off the north end of Peak which must be avoided.

The Cambrian pass, between Ousha and the large island of Chukea, or Chus Peak, is 2 cables wide, but it should not be used without a commanding breeze, on account of the strong tides.

DIRECTIONS.—Vessels entering the Sarah Galley channel from the southward generally pass westward of Laoush rock and Ousha island, and from thence the channel is between Ousha and the two patches of rock to the westward, which are almost covered at high water ; they lie N.N.E. and S.S.W. of one another, 2 cables apart, and half a mile distant from Ousha. After passing these rocks the course is N. $\frac{1}{2}$ E. $2\frac{1}{4}$ miles, leaving Teen and Yung islets, off Tang-fau, and a reef between them, to the westward ; and Hut island, off Chukea (so called from a house on its summit) with a reef of rocks off its south extreme to the eastward. The channel here is three-quarters of a mile wide.

From thence steer N.W. by N. for $1\frac{3}{4}$ miles, leaving an island with two hummocks to the southward, and Druid island to the northward ; but be careful after passing Hut island, that Flat or Liwan island (the southern small island at the inner entrance to the channel) is not brought westward of W. by N. $\frac{1}{3}$ N., as the water shoals suddenly on the north side, and the mud dries nearly all the way across from Druid island to South Chukea island, leaving only a small boat channel.

When in the vicinity of Liwan the east end of Chusan will be seen, having on it a small temple built of large stone slabs. Between Liwan and Chusan is Lokea island, the southern shore of which is not steep-to ;

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and this is the case with the whole of the islets on the south side of Chusan between this and Pih-lou, after which they become steep-to. After passing the smaller islets south of Ta-kan the shoal water will be avoided, when standing northward, by not bringing the rocks off the southern part of Pih-lou southward of West or on with Trunk point on Elephant island. Liwan has two rocks off its south end ; the anchorage in its vicinity is noticed in page 375.

CHUKEA ISLAND is about 7 miles long, north and south, and on its western side are many deep indentations, some of which are enclosed from the sea by stone walls. Near its south extreme are four remarkable peaks, and near its centre is a smooth-topped* cone, 1,164 feet high, named Chukea peak, which is one of the most prominent objects seen in making this part of the archipelago.

There are also several indentations on the eastern side of Chukea, and the southern one, Wolf bay, affords anchorage at times in the N.E. monsoon, and was resorted to in 1842 by the men-of-war from Chusan, for water. On the north side of the bay is a black islet, with rocks extending southerly and easterly from it. Fronting the bay, and 1½ miles from the shore, is a peaked rock, named Pillar, off which, at 2 cables to the N.E., are two reefs, showing at half tide. Off Pelican point, the north point of the small inlet north of Wolf bay, is a reef visible at low water ; and E.N.E. 3 cables from the point, is Nob rock, always above water.

TONGTING and PIHTING ISLANDS.—To the eastward of Chukea, at the distance of 5 and 8 miles, are two islets named Pihting and Tongting. Tongting, the outer one, 300 feet high, has detached reefs south-west of it. Pihting is a similar islet.

Pelican Rock lies E. by S. ¼ S. 2¼ miles from Pelican point on the Chukea shore, and only shows at low water springs ; but the disturbed water over it, when covered, will generally indicate its position. From the rock, Yangsi islet, off the north-east end of Chukea, is in line with the summit of Poo-too island, N.N.W. ½ W. ; Pihting islet bears E. ¼ N. ; and Chukea peak N.W. ⅔ W.

EAST ISLET and EAST ROCK.—North, 6½ miles from Pihting, is East islet, 30 feet high, and from it Loka, the northernmost of the islands on the north-east face of Chukea, bears W. by S. 4 miles. East rock, nearly awash at low water, lies E. by S. 2 miles from East islet, with Tongting islet bearing S. by E. ¼. E. 7 miles, and the summit of Poo-too, (which will be known by a look-out house on it, and the high land of Chusan forming a table top at the back of it) W. by N. ¼ N.

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* The south end of Chukea is a ridge as high as the peak.—Captain Wm. Gore-Jones, R.N.

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N.E. ISLET and NINEPIN ROCKS.—N.W. by N., 6 miles from East islet is N.E. islet, a conical rock, in form something like a haycock; it also lies N.E. ¼ E. 2 miles from the north-east end of Isthmus. The Ninepins are four pinnacle rocks with reefs around them lying 1 to 1½ miles east south-eastward of N.E. islet, and N.E. by E. ½ E. 5 miles from the summit of Poo-too.

ISTHMUS ISLAND, the outer north-eastern island of the Chusan archipelago, is three-quarters of a mile from the north-east point of Poo-too, and the channel between has deep water. A half tide rock lies E. by N. ½ N. 4 cables from the south-east point of Isthmus, with the east and south-east extremes of Poo-too in one bearing S.W. ⅔ S., and the south summit of Isthmus W. ½ N.

PU-TU ISLAND lies 1½ miles from the east extreme of Chusan, and the channel between is called by the Chinese Leenhwa-yang, or the Sea of Water-lilies. The island is 3½ miles long, north and south, and in one place only half a mile across. The temples on it are numerous, but the two largest, on its eastern side, are falling into decay. A narrow projecting point extends from the eastern side of the island, forming to the southward a deep sandy bay, in which there are 3 fathoms water; the islet off the point has a sunken rock off its east side. The western face of Poo-too is shoal, the 2½ fathoms line of soundings being 3 cables from the shore. An islet lies off the north end of Pu-tu, and some rocks half a mile farther northward; vessels may pass between the rocks and the islet.

Water.—A stream runs into the above bay, on the eastern side of Pu-tu, and it might be used should the well at the south side of the island prove dry. This stream runs in a small sandy bay to the westward of a hill with three chimneys on it, and may be known by a small joss house. The landing-place of the pilgrims who visit it is at a causeway east of the well bay.

HOCHUNG ROCK.—This sunken pinnacle, having a depth of 6 feet over it at low water spring tides, and 7 to 13 fathoms around, lies about 1⅓ miles to the eastward of the east point of Pu-tu island. From the danger, West Ninepin rock bears N. 33° E.; Half-tide rock, N. 12° E.; north-west point of Isthmus island, N. 14° W.; and the northern end of Poo-too east bluff, N. 49° W.*

ANCHORAGE.—There is anchorage off the eastern side of Pu-tu in 12 and 14 fathoms water, but several vessels have had a difficulty in purchasing their anchors; it is also much exposed, and by no means desirable in bad weather.

* Reported by Captain Peterson, SS. *Hochung*, 1877.

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To the eastward of the south point of Poo-too, and off the north-east end of Chukea, are four islands named Loka, Pih-sha, Lakeah, and Lakeati. There is a passage between them and Chukea, and a good channel between them and Poo-too.

CHANNEL EAST of CHUSAN.—Whang head, the east point of Chusan opposite Poo-too, is a low peninsula. Thence the coast trends 4 miles to another head which forms the south-east point of Chusan. Shoal water extends a mile from this shore.

The north-west and west faces of Poo-too island are shoal to, leaving, however, a channel between them and Whang head nearly a mile wide. The northern part of this channel has only 4 fathoms in it, and in working through, when southward of Whang head, do not bring the ship's head eastward of North, as the Chusan shore is shoal.

The channel off the south-east end of Chusan is 2 cables wide, and in the centre is a reef with a stone pillar on it. The flat extending towards Poo-too has only 1½ fathoms on it at low water, and some hard casts; therefore vessels drawing over 12 feet should not attempt this passage, but use the Sarah Galley channel, page 371. In working through it from the southward between Lokea and Kin-ho island, bear in mind that the shoal water extends 3½ cables from the former, and 6 cables from the latter; the above pillar or beacon in one with a cliff islet northward of it, is a good mid-channel mark. After passing westward of the beacon bring the cliff islet in line with a building on Whang head; this will lead over the flat in the deepest water, and when the south end of Poo-too bears East it may be steered for.*

CHINKEAMUN HARBOUR, at the south-east end of Chusan, carries on a considerable fishery to the eastward of Poo-too island; about 35 junks, each having from 30 to 35 men, and 250 smaller boats averaging 5 men each, are employed for this purpose, and the proceeds are carried principally to Ning-po, the fish being preserved in ice during the summer. The harbour, formed between the island of Lokea and the Chusan shore, is 1½ cables wide with 4 and 5 fathoms water in it abreast the town. The south-west entrance to the harbour, between Lokea and Maoutze island, has not more than 2¼ fathoms in it at low water; the mud extends westward 4½ cables from Lokea, and a rock lies S.S.E. a cable from the east end of Maoutze.

H.M.S. *Pylades* anchored in 5 fathoms between Maoutze and Chusan, the width of the channel being 2¼ cables; the land, 600 feet high on the

* *See* Admiralty Chart :—China, East Coast, Sheet 8, No. 1,199; scale, $m = 0{\cdot}25$ inches.

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Chusan side, occasioned the squalls at times to be very violent. H.M.S. *Conway* anchored in 5 fathoms, W. ½ S. 8 cables from Liwan island, which has two rocks off its south end (page 372).

Chinkeamun is 11 miles eastward of Ting-hai harbour. The Shei-luh channel close along the southern shore of Chusan has deep water in it, but in some places it is so narrow as to be practicable only for small steam vessels or boats.

The principal islands bounding the south side of this channel are, (reckoning from the eastward,) Maoutze, Ta-kan, Yin-gar, and Ao-shan. Between Ta-kan and Maoutze there are not more than 6 feet at low water, and the same depth between the two last; between Ao-shan and Deer island there is a deep water channel, but it is confined by mud-banks and obstructed by reefs.

CHUSAN ISLAND, so called from its supposed resemblance to a boat, is 51 miles in circumference; its extreme length in a N.W. and S.E. direction being 21 miles, and its greatest breadth 10½ miles. From the beach at Ting-hai on the south side of the island to the northern shore, the distance across is 7 miles; towards the eastern end it becomes narrower. The island is beautifully diversified with hill and dale and well cultivated. Of the numerous small streams which run from the mountains, the most considerable is the Tung kiang which falls into Ting-hai harbour. The products are rice, millet, wheat, sweet potatoes, and yams; the tea plant is found everywhere, but is treated with little or no care. The cotton plant is largely cultivated near the sea. Besides the principal harbour of Ting-hai there are three other commercial ports, viz., Chinkeamun at the south-east end of the island, Ching Keang or Singkong on the north-west side, and Shaaou at the north end.

The town of Tinghai is 1¾ miles in circumference and surrounded by a wall 14¾ feet high and 13 feet wide, surmounted by a parapet 14½ feet high and 2 feet wide. The southern face runs east and west; the west face north and south; and the eastern face north 350 yards, and then north-west. A canal, 33 feet wide and 3 feet deep, nearly encircles the city, and enters it near the south gate, which is about half a mile from the shore of the harbour. Canals form the principal means of transport, the roads being merely footpaths on the stone embankments which prevent the encroachment of the sea on the rice fields. Every large field has its canal for the purpose of carrying away the produce.

The population of the town and suburbs at the commencement of 1843 was about 27,500, but in 1846 it had increased to 35,000; the population of the entire island was estimated at 200,000. The principal exports are fish, coarse black tea, cotton, vegetable tallow, sweet potatoes, and some wheat.

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The burying ground of the British forces, who occupied Ting-hai from 1841 to 1846, is situate on the slope of the hill east of the joss house.

Water.—The water is not good at Ting-hai, and is sometimes scarce, the tanks in the rice fields near the sea being the only supply,* excepting wells which afford but a limited quantity; no running streams were found. The place latterly adopted for watering by the squadron during the China expedition in 1840–1843, was in the bay westward of Chuh or Guardhouse isle.

WINDS and WEATHER.—The following is a meteorological abstract deduced from monthly registers, kept at Chusan during the period the island was occupied by the English troops in 1840:—

The climate of Chusan is subject to a range of temperature similar to hat in the same latitude upon the coast of North America; the thermometer in the shade standing at 103° in September, and at 25° in February.

September was generally fine, only four rainy days for short periods; 1·8 in. of rain fell. The barometer generally standing below 30 inches; falling in strong south-easterly, and rising with northerly winds: height of the cistern above the sea 72 feet. Very strong breezes were not experienced during this month. Winds easterly 10 days, south-easterly 6 days, north-easterly 8 days, and north-westerly 6 days. Range of thermometer 103° to 65°.

The first 10 days of October were fine, the remainder of the month overcast; weather squally, much rain during the last week. Except the four first days of this month, the barometer was never below 30 inches, and rose as high as 30·33 in., rising with fresh winds from the north-west. The winds variable, changing frequently during the 24 hours; they were from the North 6 days, N.E. 12 days, N.W. 9 days, and 4 days from S.E. to S.W. On the 29th the meteorological instruments were removed to the suburbs, where the height of the cistern of the barometer above mean tide level was 24 feet. Range of thermometer 92° to 51°.

November was generally overcast with rain, the barometer in easterly winds fell below 30 inches. Winds were N.E. 2 days, N.N.W. 8 days, N.W. 4 days, northerly 4 days, westerly 4 days, S.S.W. 2 days, and calm 4 days. Range of thermometer 74° to 40°.

In December the weather was finer than last month; the barometer kept very high, being 30·59 inches on the 10th; winds light from the N.W.; the mercury generally rose as the wind freshened from that

* This water is not fit for use; and if not filtered and boiled, is productive of malarious fevers.

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quarter, and during calms fell to 30·02 inches. Winds south-westerly half a day, westerly 2½ days, north-westerly 15 days, north-easterly half a day, northerly 5 days, easterly 1 day, and calm 6 days; much rain during the last week. Range of thermometer 77° to 27°.

During January the weather was misty with much rain; barometer ranging from 30·61 to 30·08 inches, falling previously to south-easterly winds. Snow the last two days. Winds fresh with squalls; from the N.W. 20 days, West 2 days, S.W. 1 day, S.E. 1 day, North 3 days, and calm 3 days. Range of thermometer 60° to 28°.

February was generally fine; winds N.W. 5½ days, North 2½ days, S.W. 1 day, S.E. 2½ days, calm 5 days. Range of thermometer 60° to 25°.

The greatest range of temperature during 24 hours was 28°. During January, the barometer was at the height of 30·61 inches, and generally fell in light or easterly winds. A few days south-easterly winds occurred in September, but the northerly monsoon could not be said to have commenced until the beginning of October. The following are the number of rainy days in each month: September 4 days, October 3 days, November 12 days, December 7 days, January 11 days, February 3 days.

Fogs are prevalent in April; about the period of the change of monsoon.

TING-HAI HARBOUR, formed on the south side of Chusan, is fronted by many small islands, between which are the several channels leading to it. The outer and westernmost island is Ta-maou or Tower Hill, east of which and distant 1 and 4¼ miles respectively are the large islands Teijo or Elephant island and Pih-lou. Whithin, or to the northward of these, reckoning from the westward, are the islands called Ha-tse or Bell, Pwanche or Tea, Seaou-keu or Deer, and Ao-shan. The two small islands Tawoo or Trumball, and Wae-woo or Macclesfield, lie inshore or to the north east of Tea island, fronting the city, and there are many small islands and rocks among those larger ones above named.

The harbour is difficult of access in all its approaches, owing to the strong tides and sunken rocks. The best approach is through Tower Hill and Bell channels, the latter being between Tower Hill and Bell islands, and between Bell island and Tea island; in these no hidden danger has been found; but the tides are strong, and sailing vessels in light winds must be careful that they are not set by their influence between Tower and Elephant, or between Tea and Elephant islands, where the ground is foul and the channels narrow and deep.*

* *See* Admiralty Chart:—Chusan Archipelago, South Sheet, No. 1,429; and Ting-hai Harbour, No. 1,395; scale, $m = 4$ inches. Joss Hill, a hill on the northern shore of Ting-hai harbour, is between 130 and 140 feet high.—Remark book of Navigating Lieutenant J. Brown, H.M.S. *Hornet*, 1879.

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Directions through Tower Hill Channel.—The best approach to Ting-hai harbour for large or unhandy vessels is through Tower Hill channel. Unless favoured by a commanding breeze and neap tides, they ought not to pass between Roundabout island and Ketau point, as the tides run there with great strength, and outside Roundabout, the whirls are often so strong that a ship can with difficulty be kept on her course, even under steam. After passing Ketau point steer to pass a convenient distance from the south extreme of Tower Hill island. Should the tide fail, anchorage will be found under the islands eastward of Tygosan island; for which purpose pass 3 cables southward of Square Stone islet, to avoid the reef lying 1½ cables S.W. of it, and anchor before the channel between Little Tygosan and Chuen-pi islands opens, as the water shoals suddenly off the east end of Entrance island.

Having rounded Tower Hill island, haul up, steering first for Bell island then for Tea island. The soundings in Bell channel, between Bell and Tower Hill islands, vary from 30 to 40 fathoms; but off the north-west end of the latter is a mud bank of 3 fathoms water extending 1½ cables off shore.

There is good anchorage in 10 and 12 fathoms between Bell and Tea islands, nearer the latter, but vessels intending to remain here should not open the channel between Bell and Chusan, as the tides are stronger and the ground loose. On proceeding from hence to Ting-hai harbour, take care to avoid the *Nab*, a sunken rock with 14 feet over it at low water, lying 2¼ cables from the Chusan shore, and South of a small hillock in the valley near the shore; the marks for it are Taching point, the west extreme of Tea island, in one with the east side of Taewang or Bell rock, S. ¼ W., and the south point of Guardhouse isle nearly in line with the summit of Tawoo or Trumball island. A 3-fathoms patch lies about 3½ cables W.S.W. of the Nab, and E. by N. ⅓ N. nearly 4 cables from Ap-tan-shan island.

The Spithead anchorage on the Chusan shore, between the Nab rock and Guardhouse isle, will be found a convenient place for watering; the anchoring ground is steep-to, and the tides are irregular, and off the entrance to the watering creek is a mud flat of 3 fathoms water. With light winds, vessels should avoid the strength of the ebb when passing through the channel between Tea and Guardhouse islands, for it is liable to set them through the Melville channel. A ledge of rocks covered at high water, extends one cable from the high-water mark at Kouching point, the north extreme of Tea island.

Proceeding towards Ting-hai harbour, and being abreast of Guardhouse isle, steer towards Wae-wu or Macclesfield island, taking care to avoid the Middle ground, which has only 2 feet on its shoalest part.

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Tower hill in line with the slope on the southern rise of Tea island will lead along the southern edge of this shoal, in 4 fathoms. The Wae-woo channel is only 2¾ cables wide between the 3 fathoms line on the edge of the Middle Ground and Wae-woo and Tawoo islands. The usual anchorage is abreast Taotau, the suburb of Ting-hai, but vessels must moor as the eddies are strong. The channel between Chusan and Guardhouse isle is only fit for boats.

CAUTION.—Spring tides set at the rate of 3 and 3½ knots per hour in the Tower Hill channel, and with light winds and a strong flood vessels have been swept away to the westward, and carried by the tide beyond Just-in-the-Way, and even through the Blackwall channel; and after rounding Tower Hill and entering the Bell channel many have been borne by the ebb amongst the islands between Tower Hill and Elephant island, or between the latter and Tea island, where the channels are narrow, the water deep, and the ground foul. In these cases the bower anchors and chains should not be used, but a good kedge and stout hawser, which (as the holding ground is good and if care be taken to conn the vessel and not break her sheer) will bring a vessel up and prevent her being driven into these narrow passages, where some have been brought up in from 30 to 40 fathoms water, with two anchors down and three or four round turns in the hawse.

Having rounded the north end of Tea island with a strong ebb, it is necessary to guard against its taking the vessel through the Melville channel, and if not able to pass northward of Macclesfield island, send the boats a-head and endeavour to keep the vessel to the northward of Takeu and Sarah islands, where the water is not so deep.

Through Melville Channel. — The Melville or southern passage to Ting-hai harbour is between Elephant and Deer islands, but as two sunken rocks lie in the centre of the channel and narrow it to 1¾ cables, it should not be attempted unless there be a commanding breeze, and the mariner have a thorough knowledge of their position. Its navigation is rendered more difficult in the neighbourhood of these dangers by the tides rushing through four different channels into this, and forming eddies which render a vessel unmanageable even with a good breeze at the springs.* A boat a-head will be found useful at the neaps.

The entrance will be easily recognised by Elephant island, which is remarkable from a curious crag near the summit; and by the cone-topped

* Commander Lacy, R.N., remarks, "The *Adventure* came out through the Melville channel with the ebb tide, which I should never think of doing again in a large ship, as she was nearly unmanageable in consequence of the strong eddies, and we had the greatest difficulty in keeping the marks on."

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island of Pating, to the N.N.E. of it. There is anchorage in 16 and 18 fathoms in the entrance of the channel between Elephant and Tung islet; but the holding ground is not good. Beyond Round island, which lies 4 cables from the north-east point of Elephant, the water deepens to 30 and 40 fathoms towards the southern sunken rock, on which H.M.S. *Melville* struck in 1840.

The Melville rock, of only 10 feet water, lies S.E. by E. $\frac{2}{3}$ E. 2 cables from the Black rock, and E. by N. $\frac{1}{3}$ N. $1\frac{3}{4}$ cables from the rocky ledge extending towards it from Ledge island, and which covers at half tide; the marks for it are the Cap rock in line with the saddle of Kintang island, bearing W. by N., and the Joss house on the hill near the suburbs of Ting-hai showing between Trumball and Sarah islands, N. $\frac{1}{2}$ E. Dundas, the northern sunken rock, is a small patch of only 9 feet water; it is about 7 to 10 yards in extent, and lies N. $\frac{1}{4}$ W., $1\frac{3}{4}$ cables from Melville rock, and N.E. by E. $\frac{2}{3}$ E. 2 cables from the Black rock, with the bushy tree on the eastern slope of Ta-keu island, in line with the middle beacon on Tsingluy Tau or Beacon hill, N.E. $\frac{1}{4}$ E., and the north end of the Black rock on with the south side of Cap rock W.S.W.

From abreast Roundabout island a N.W. $\frac{1}{2}$ N. course for $4\frac{1}{2}$ miles will lead to the entrance of the Melville channel. Pass on either side of Round island, and when northward of it, its east extreme touching Trunk point bearing S. $\frac{1}{2}$ W., will lead* between Melville rock and Ledge island, and between Dundas rock and Black rock, rather westward of mid-channel. When clear of the Dundas keep in mid-channel, and when abreast the south end of Sarah island steer for the west end of Macclesfield island, which should be rounded rather close to avoid the Middle Ground, the southern edge of which, in 3 fathoms, is only $2\frac{3}{4}$ cables distant. A rock, covered at high water, lies barely a cable's length from the northern face of Macclesfield.

Through Deer Island Channel. — Ting-hai harbour may also be entered from the eastward through a branch of the Melville channel, by passing between Deer and Takeu islands, which are $1\frac{1}{2}$ cables apart. The Melville and Dundas rocks will be avoided by keeping the western hillock of Takeu open of the summit of Tawoo island, or by keeping Deer island aboard, but it must be borne in mind that neither shore of the channel is steep-to. The Beacon rock, awash at high water, to the north-east of Takeu, may be passed on either side; and from thence steer for the Chusan shore, keeping a cable's length eastward of Grave island,

* Mr. Joseph G. Dathan, R.N., remarks, "this is a very good and distinct mark, as also is the cross mark for Dundas rock; the others are not so easily made out by a stranger."

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and when the harbour beacon is seen north of it, it can be steered for, passing between it and the Chusan shore, keeping the latter aboard, until Taken is shut in by Trumball.

This passage, although narrower, is superior to the Melville channel, as vessels have the tide in their favour all the way. The principal objection to its use is the liability to flaws of wind under Deer island; but the main point to be guarded against is the flood from the eastern channels carrying them so far westward as not to fetch far enough eastward of Grave island. A spit extends from the south-east end of Tawoo, the 3 fathoms line being 3 cables from the shore; the south end of Wae-woo open of the summit of Tea island, leads south of it. Between Ta-woo and the shore there is a middle ground of 1 to 3 fathoms, on the inner edge of which is a rock marked by a beacon pole; between the rock and the shore is a deep water channel, a cable wide, leading to the anchorage off Tao-tau

Anchorage.—Caution.—At the anchorage, in 10 fathoms, E.S.E. of Wae-woo, it is indispensable to moor taut owing to the eddies, for however carefully a vessel may be brought to with a single anchor, and afterwards well watched, she will scarcely fail to foul her anchor badly and probably trip it. This anchorage has been recommended as convenient and possibly a more easterly position may be less objectionable. A preferable anchorage is, in 5 fathoms, E.S.E. of Grave island, where there are no eddies and the tides are regular but not strong.

The Channel between Bell Island and Chusan is not recommended, owing to the tides, which run 5 knots at springs. Nearly mid-channel is Kwa-fu, a half tide rock, with a stone beacon on it; and to the S.W. of the beacon is a 9 feet patch lying with the south end of Kwo-kan, the westernmost of the two islets on the Chusan shore, in line with the south end of Kiddisol island. Neither is the north end of Bell island steep-to, consequently, should a vessel from necessity use this passage, the channel between the beacon and the Chusan shore should be preferred to that between the beacon and Bell island.

KIDDISOL ISLAND, lies 2 cables southward of Yanglo point, the south-west extreme of Chusan, with a deep water channel between, but the eddies are violent at the springs; there is a patch of $2\frac{3}{4}$ fathoms off its south-west end. From hence to Sinkong point, 4 miles to the N.W. by N., the coast line of Chusan is mud, with the exception of a small hillock at the edge of low water.*

Anchorage in 10 and 12 fathoms will be found all along the Chusan shore between Yanglo and Sinkong points, but in standing towards the shore be careful as the water shoals suddenly after 10 fathoms.

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* *See* Admiralty Chart of Kintang channel, No. 1,770, scale, $m = 1{\cdot}2$ inches.

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CHING KEANG HARBOUR, on the western side of Chusan and distant 7 miles in a direct line across country from Ting-hai, is formed between the islands Wa-teo, Lin, and Latea, (otherwise called Outer, Middle, and Inner Hook,) and Chusan. Upon the islands, and on the point near the southern entrance, are extensive stone quarries. There is a white rock off the south west point of Wa-teo, and a mud bank extends from the island nearly to the rock and also bounds its west side. Between Wa-teo and Chusan the entrance to the channel is 6 cables wide with 7 and 8 fathoms water in it, forming a snug anchorage much frequented by the junks as a stopping place, and defended from pirates by a fort. Abreast of Lin, the small island next north of Wa-teo, the channel is less than a cable wide, with 7 fathoms water. The town stands on the Chusan shore, on the banks of a stream, which at high tide is navigable for boats. Here the channel is also less than a cable wide, and the depth 5 to 4 fathoms.

KINTANG or SILVER ISLAND is between the west end of Chusan and the entrance of the Yung or Ning-po river. Near its south-east extreme is a remarkable saddle hill 1,432 feet high, which with the Cap rock forms one of the marks for the Melville rock (p. 380). Another remarkable peak, 1,520 feet high, is $1\frac{1}{4}$ miles northward of the saddle hill.

Alligator Point and Beacon.—Alligator point, the south end of Kintang, has a reef, which covers at half tide, extending 2 cables to the southward; there is a stone beacon painted *red* on the extremity of the reef. From the beacon, Longnose point bears N. $56\frac{1}{4}°$ W., and Just-in-the-way bears S. 87° E.

Algerine point, the south-east extreme of the island, has an islet connected at low tide by a mud flat, from which a ledge of rocks extends S.S.E. 2 cables, the south end of which covers at high water.

Anchorage.—The eastern face of Kintang is bold-to, without any anchorage along it. The western side affords good temporary anchorage, but it is advisable to take up a position within half a mile of the shore to be out of the strength of the tide.

Ta-outse harbour.—Off the north end of Kintang there is a group of seven islets, amongst which there is anchorage; off its north-west end is Taping island, separated by a narrow channel of 4 to 6 fathoms. Southward of Taping is the small harbour of Ta-outse or Lukon, a former station for opium vessels, which affords good anchorage in 7 to 10 fathoms, sheltered by the small island of Ta-outse. The entrance is between Kintang and Ta-outse island, and the channel is barely 2 cables wide

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Between Ta-outse and Taping there are not more than 8 feet at low water.

Ta-outse harbour* is small, but affords good anchorage, and may be recommended as a sanitary station for vessels obliged to make a lengthened stay in the river Yung. Supplies of all kinds can be readily obtained by native boats from Ning-po. Kintang is well cultivated and produces abundant supplies, but they all appear to be sent to Ning-po.

KINTANG CHANNEL.—If bound to Ning-po or proceeding by the Kintang channel, *see* Directions on p. 398.

STEWARD ROCK, 50 feet high, lies in the middle of Blackwall channel between Chusan and Kintang island. The depths in its vicinity are 25 to 45 fathoms, except on a rocky patch 2 cables to the eastward, where the least water that has been found is 6 fathoms.

BLACKWALL CHANNEL, between Kintang and Chusan, takes its name from Tsih-tze or Blackwall island, about 6 miles in circumference, which divides its northern entrance into two passages, the western Blackwall pass, and the eastern Ketsu pass, which is between the four islets, forming Ching Keang harbour, on the Chusan shore and Blackwall. The southern entrance, between Kiddisol and the south-east point of Kintang, is nearly 5 miles wide, and just within it is the Steward rock described above.

From the anchorage off Sinkong point, on the Chusan shore, the distance through the Blackwall pass is 6 miles, and no anchorage will be found until near Cliff islet, on the north-west face of Blackwall, from which extends, 1½ miles, a tongue-shaped shoal of 3 to 5 fathoms, exposed to northerly winds. This pass is three-quarters of a mile wide, but the eddies in it are so strong that vessels have been turned round in a double-reefed topsail breeze. Rondo, a small islet in the pass, lies close off the south-west end of Blackwall island, and there is deep water between them, but the Kintang side will be found the best to border on. There is a long bay on the Blackwall side, from the north end of which, Blackwall point, a reef extends westward 1½ cables, to avoid which do not open Steward rock eastward of Rondo islet.

The Ketsu pass is not recommended as the tides are strong, and it is contracted to 3 cables breadth by the flat island of Ketsu. The channel between it and Blackwall is 3 cables wide; a sunken rock also lies 1¼ cables from the north-east point of Blackwall. Between Ketsu and Chusan the channel is only a cable wide, and neither shore is steep-to.

BROKEN ISLAND is connected at low water to the north-west extreme of Chusan by a mud bank, steep-to on the north-eastern side.

* Captain C. F. A. Shadwell, R.N., H.M.S. *Highflyer*, 1858.

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Crack islet lies about half a mile from its north point, and between them is a narrow channel of 5 to 8 fathoms water, but it is not calculated for vessels of large draught, as a bank of 6 to 18 feet water extends a mile from the north-west point of Broken island. A mud spit runs off north-westerly 4 cables from Crack islet.*

DUNSTERVILLE GROUP, N.W. 3½ miles from Broken island, is a batch of low islets which may be approached as convenient, the soundings between them and Crack islet varying from 5 to 4 fathoms. The tides are strong in this neighbourhood, the flood running to the west, the ebb to the east.

SHAAON HARBOUR, or North bay, formed between Chang-pih or Fisher island, and the north end of Chusan, is 2 miles long, 1¾ miles wide, and has a varying depth from 5 to 9 fathoms. Broken island, as before stated, is steep-to on its north-east side; from the western part of Chang-pih, shoal water extends half a mile. The southern shore of Chang-pih is an extensive mud bank, a considerable portion of which has been enclosed from the sea by embankment; off its south-east end, the water is shoal, the 3 fathoms line being half a mile from the shore.†

The Chusan shore is bordered by a mud bank, which renders landing unless at high water, difficult, except in one place near the eastern end of the harbour, where there is a causeway. Near the causeway are some houses, but the principal village is some distance up the valley. A small islets lies off the north end of Chang-pih, and a group of islets, named Cluster or Midway islands, off the north-east end.

DIRECTIONS from SHAAON HARBOUR through KWEI CHANNEL.—Vessels bound to the eastward from Shaaon harbour may pass either through the Kwei channel, between Lan-sew or Sheppey island and Chusan, or to the northward of Lan-sew, which is the better channel of the two, but both are difficult for a stranger. A sunken rock lies 3 cables from the Chusan shore, S.E. 2 miles from the south-east point of Chang-pih, with the south extreme of Chang-pih bearing W. ¼ N., the largest of the Cluster islets, N.E. of Chang-pih, N. ½ W., and the summit of Lan-sew open of the rocks off Ma-aou point E. by N. ¼ N.

The Kwei channel, never to be attempted during the strength of the tide, is between the large island of Lan-sew, 4 miles east of Chang-pih and the Chusan shore, and although 1½ miles broad, the navigable passage is greatly contracted by the numerous rocks and islets on either side. At

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* *See* Admiralty Plan of Chusan Archipelago, North Sheet, No. 1,969, scale, $m = 0{\cdot}8$ of an inch.

† *See* Admiralty Plan of North Bay, No. 1,744; scale, $m = 1{\cdot}2$ inches.

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its western end it is only three-quarters of a mile between the two rocks off Ma-aou point and the Houblan islets extending from the west side of Lan-sew. In the centre, the Lan-sew shore is bold, but two chains of islets from Chusan stretch half way across. The eastern end is narrowed to 2 cables between Kanlan point on the Chusan shore and the small islet with a reef off its south-east end, lying south of Sewshan or Grain islet off Lan-sew.

There is the Kwimun channel, close in to the Chusan shore, but it is crooked and a sunken rock lies near the centre.

The island of Lan-sew appears formerly to have been two, the intervening space having been gained from the sea by embanking; it is now called by the Chinese Lan-shan; also Saw-shan: and is 3½ miles long and 2½ miles broad.

Through Channel North of Lan-sew.—When leaving the anchorage in Shaaon harbour by the Chang-pih channel, and intending to pass north of Lan-sew, steer about N.E. by E. for Kwi-si, a barren island with a round peak upon it. The southern side of this island is steep-to, and the distance between it and the north-west point of Lan-sew is 1½ miles; a mud bank dries 1½ miles from the western side of the latter and is steep-to, *the lead giving no warning*, but its northern edge will be avoided by keeping the north end of Mo-un (the largest islet off the north end of Lan-sew) open of the north extreme of Lan-sew.

Having passed Kwi-si steer for the next island, Kwan, the south shore of which keep close aboard, to avoid a reef which lies half a mile to the southward and covers at high water; from the reef Kwi-si hill bears W. by N., and the highest part of Lan-sew S.S.W., ½ W.; the ground between this reef and Lan sew is foul. Although the channel is half a mile wide it is difficult to shoot through, owing to the eddy tides and flaws off Kwan, which is 600 feet in height. When the reef is passed, take care to avoid a ledge of rocks extending a short distance from the north-west point of Mo-un, which bounds the channel to the southward.

To the eastward of Kwan are nine islands lying off the south-east end of Tae-shan to the northward; there is a reef off the southern and of the nearest. From thence an East course may be steered to sea along the southern coast of Keu-shan island and the Fisherman's group. The channels north of Kwi-si and Kwan are described on page 390.

Anchorage.—Vessels wishing to anchor on the east side of Lan-sew island may haul to the southward after passing the first islet east of Mo-un, running between it and Gan-ching, a cluster of rocks to the eastward. At the east end of Lan-sew is a low cliff, named Harty island, which may be passed at a cable, when hauling to the southward, anchorage will be found in 5 fathoms, the water shoaling gradually towards the shore.

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H.M.S. *Pylades* (in 1840) anchored here in 5½ fathoms, with the east end of Harty island N. ¾ W. 6 cables, and Grain islet S.W. by W. In the northerly monsoon there is a better anchorage at 7 miles to the north-east in Peaked Rock bay on the southern shore of Keu-shan.

CLIFFS and DOUB ROCKS.—To the eastward of Lan-sew, at the distance of 2 miles and 5 miles respectively, are two cliff islets, called Cliffs and Doub (Double) rocks. South 2 cables from Cliffs, the western islet, is a ledge of rocks nearly awash at high water, and the ground in its neighbourhood is foul; there are rocks, also, which show at low water, lying 1½ cables from the north-east point of the same islet.

N.E. and EAST COAST of CHUSAN.—The north-east coast of Chusan, east of Lan-sew, trends S.E. 11 miles to Whang head, a low peninsula forming the east end of Chusan. At the distance of 3 miles is Thornton island, with a narrow passage between it and Chusan, and a deeply indented bay westward of it, in which the mud dries out a long way, rendering it difficult to land except at the extreme points; an islet and rocks lie off the north-east face of Thornton. At 2¾ miles farther to the south-east is Tsae, a larger island with a remarkable fall in the hills near its centre. The Chusan shore hereabout is *shoal-to*.

To the eastward of the north part of Tsae are three islands at the distance of half, 1½ and 3¼ miles. The nearest, named Meih-yun, the largest of the three, has a patch of rocks lying N.N.W. 4 cables from its north point. Meih-ting, the central islet, has a pinnacle rock lying E. by N. half a mile from it, and a rocky patch at 2 cables westward of its north extreme. The outer islet, Jow rock, is a narrow cliff with a rock lying one cable from its north side. There are islets also N.W. of Tsae.

Half way between Tsae and Whang head is a low island, named Ta-chen, and the depth in its vicinity is 3 fathoms. A reef lies three-quarters of a mile south-east of Ta-chen, and a quarter of a mile from the Chusan shore, with the north-east point of Ta-chen in one with north-east point of Tsae N.N.W., and the north end of the Poo-too group E. by N.

Between Ta-kan and Maoutze there are not more than 6 feet at low water, and the same depth between the two latter; between Ao-shan and Deer island there is a deep water channel, but it is confined by mud banks and obstructed by reefs.

LAN-SEW BAY, 10 miles across and 10 deep, is formed between the north-east face of Chusan and the extensive chain of islands running in a E.N.E. direction towards Video island. The navigation of the southern part of this bay, from the north-west point of Chusan to Poo-too island, has been noticed above and on page 385; the northern part,

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beginning at Video, will now be described, and also those anchorages which may be useful to a vessel proceeding to Ning-po or Chusan in the northerly monsoon.

The NORTHERN PART of the CHUSAN ARCHIPELAGO consists of numerous islands and rocks, which extend northward of Chusan a distance of 40 miles to the entrance of the Yang-tze kiang, and front Hang-chu bay. All of them are inhabited, with the exception of the outlying Barren isles and Leuconna, and small supplies may be obtained, but the natives, except at Tae-shan island, were in a very miserable condition, owing to the constant visitation of pirates. Many good anchorages will be found among them, in depths gradually increasing from 5 fathoms off Hang-chu bay to 30 fathoms on the outer part of the bank.* The outer islet, Jow rock, is a narrow cliff with a pinnacle rock between it and Meih-ting.

As vessels bound to the Yang-tse kiang usually pass eastward of this archipelago, and as, in the northern monsoon, they endeavour to make the island of Video if they cannot weather the more northerly Barren isles, we shall commence with the eastern islands, and then continue the description westward.

VIDEO ISLAND, in lat. 30° 8′ N., long. 122° 46′ E., bearing E. by N. ½ N. 22 miles from the summit of Poo-too, and N.E. by N. 19 miles from Tong ting islet (page 372), is 996 feet high nearly square, and has a bold precipitous appearance, and a remarkable white cliff which shows when the island bears N.W. by N.; when first seen from the southwest the island appears flat and shelving to the westward.

BROTHERS and SISTERS.—E. by N. ½ N. 5 miles from Video are four rocks called the Four Sisters of an average height of 30 feet; and E. by N. 9 miles from Video are two rocks named the Two Brothers. As the soundings in this vicinity are above 30 fathoms, any cast below that depth will, in thick weather, point out that a vessel is among the chain of islands.

LEUCONNA ISLAND (about 500 feet high) bears N.N.E. ¼ E. 18 miles from Video, and when seen from the southward it makes like three abrupt, round-topped hummocks.

BEEHIVE ROCK, a remarkable rock 35 feet high, has 14 and 16 fathoms water around it, and a rock awash lying 3 cables to the eastward. Leuconna bears from it E. by N. ½ N. 12½ miles, and Video S. by E. ¼ E. 13 miles.

* *See* Admiralty Chart :—China, East Coast, Sheet 8, No. 1,199.

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BARREN ISLES, three in number, in lat. 30° 43′ N., long. 123° 7′ 14″ E., are three-quarters of a mile in extent, east and west, and 150 feet high, and at 2 cables south-east of the eastern isle is a reef* awash at high water. They lie E. ¼ N. 16 miles from East Saddle island, and N.N.E. ¾ E. 20 miles from Leuconna.

FISHERMAN'S GROUP.—North of Chusan, a chain of islands extends from Video W. by N. ½ N. 45 miles, terminating in the Volcano islands, facing Hang-chu bay. Between Video and the Fisherman's group, the first islands westward, there is a channel 2 miles wide; but among the Fisherman's group (consisting of four islets and several rocks) vessels ought not to go. The best channel through the chain is that known as "Steep island pass" close to the westward of this group, S.S.W. ½ W. 9½ miles from the Beehive.† From this to Keu-shan, westward, is 10 miles, with many intervening islands, but the channels between them ought *not to be attempted*, as, from the character of the land, there are, no doubt, many sunken rocks.

LIGHT.—Steep Island.—A lighthouse 47 feet high, (an iron circular tower, painted black, with the dwellings and boundary wall coloured white,) has been erected on Steep island.

The light is a *revolving* light, showing *white flashes* at intervals of *thirty seconds*, elevated 243 feet above the sea, and should be visible in clear weather from a distance of 22 miles.

The light is obscured by Tripod island, between the bearings N 21° E. and N. 41° E.; also, to the east and south-east of Video and the Fisherman's group, between the bearings N. 58° W. and N. 88½° W. To the westward of Hall and Hewett islands, the light is obscured between the bearings S. 63½° E. and S. 82° E., with the exception of a ray between the bearings S. 66° E. and S. 64½° E.

Fog Signals.—During thick or foggy weather, should the keeper hear a bell, fog-horn, steam whistle, or any sound indicating the proximity of a vessel, *three guns* will be fired in succession, with an interval of *three* minutes between the first and second, and between the second and third; and if the vessel's fog signal be still heard, the firing will be repeated after an interval of *ten minutes*.‡

Anchorage.—Shelter will be found under Hall island, the largest of these intervening islands, at 7 miles westward of Fisherman's group; but

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* This reef appeared to extend three-quarters of a mile south-east of the isle.—Edward H. Hills, Master, R.N., H.M.S. *Highflyer*, June, 1859.

† "This is the channel almost universally used by mail steamers."—Captain E. M. Edmond, R.N.R., P. and O. steamer *Malacca*, 1876.

‡ Consul C. Allen, Commercial Report, China, 1881.

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a vessel had bettter go on to Keu-shan island, and anchor on the south side in Peaked-rock bay (page 386), bearing in mind that the head of the bay is shoal.

KEU-SHAN and CHANG-TAU.—Keu-shan, the first large island of this chain, is 8 miles long, east and west. Peaked-rock bay is westward of Eden point, the south-east end of the island. Along the southern side of Keu-shan are several islets and rocks, to which give a berth of 2 cables. Off the western part of Keu-shan is Chang-tau island, the peak of which rises over the west side of the island to the height of 920 feet above the sea, rendering it one of the most conspicuous objects of the chain. Between the islands is a narrow channel, named Chang-tau strait, carrying 5 fathoms, but the south point of Chang-tau is not steep-to.

TAE-SHAN CHANNEL is west of Chang-tau, and between it and Tae-shan. Its approach from Lan-sew bay is 1⅓ miles wide between the west part of Keu-shan and the Doub and Cliff rocks (page 386). From the Cliffs the southern entrance to the Tae-shan channel bears North, and is formed by the islets of Pou-no and Pou-ti to the west, and Funning island, with the Cliff islet south of it, to the east; off the west end of the latter is a reef, covered at high water. N.W. by W. 6 cables from Funing are two low rocks, and the space between them and Funing is shallow. Between these rocks and the south point of Chang-tau is Chang-tau strait.

The Tae-shan channel is a mile wide. Both shores are shoal-to, and a sunken rock lies S.S.E. 2 cables from the projecting point on the Tae-shan shore. A mile N.E. of this point is Gan-su island, which has a double peak on it, and there are two islets on each side; the channel lies between it and Chang-tau, under the north head of which is a low rock.

The directions for passing south of Tae-shan island, between Kwan and Lan-sew, have already been given in page 385; but it remains to describe Tae-shan and the channels between it and the Volcano islands.

TAE-SHAN ISLAND, 8 miles long and 5 broad, and the third in point of size in the archipelago, Chusan and Luhwang only being larger, is very populous, and carries on an extensive manufactory of salt from sea water. The centre of the island is an extensive plain, with many villages; the hills also separate near the eastern extreme, leaving a level plain across the island. Off the south-east end of the island are nine islets, among which vessels have no business to go. There is a passage close to the eastward of Kwan; but owing to strong tides and the flaws under the bluff land of this island, vessels had better pass south of Kwan and between it and Kwi-si islands, where there is a channel a mile wide; the mud dries 3 cables from the west end of Kwan.

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To the northward of Kwan and Kwi-si are three islets; the best channel is between Ning, the western islets, and Kwi-si, after which a vessel can haul up for the Tae-shan shore, and anchor in 4 or 5 fathoms off Wou-hou creek, observing that there is a reef which covers at first-quarter flood, lying with the summit of Kwi-si bearing S. by E. 2½ miles, and Ellicott isle, about 3 miles north-west of Kwi-si, W. by S. ½ S. 2¼ miles; the north end of Peshan islet in line with the north point of Kwan bearing E. by S. ½ S., will lead south of it.

The mouth of Wou-hou creek is 6 miles N.E. from the summit of Chang-pih, and it was here that the Chinese forces assembled in 1841 for the retaking of Chusan. The creek runs through the centre of the island, but is not accessible to large boats at low water. There is another creek near a village farther westward, but with these exceptions the whole face of this side of Tae-shan is difficult of access in consequence of the mud drying a long way off shore.

At Towtau point, the west end of Tae-shan, the hills come down to the water's edge, and midway between it and Chang-pih are Miles and Ellicot isles, with 5 and 7 fathoms in their vicinity. The Show islands, one of which is high, lie 6 cables westward of Towtau point; the channel between having 4 fathoms at low water. On the north side of Tae-shan are four islets, which are too small to afford much protection in the N.E. monsoon, but during the summer good anchorage will be found off the town near the centre of the island. The bay is very capacious, but the whole of it is shoal, and the tides are very strong.

KESTREL ROCK.*—This rock awash at three-quarters ebb, was passed by H.M.S. *Kestrel*, 1876, within 30 yards, it lies nearly in mid-channel between Beecher and Show islands, 8 miles to the northward of Chusan. From the ship at the time of passing the rock the south extremes of Beecher islands were in line bearing W. by N. northerly, and the centre of Miles island S. ¼ E.†

VOLCANO ISLANDS.—East Volcano, with four peaks on it, lies 6 miles westward of Towtau point, and is 4 miles long north and south. East of its south point is an islet; and between it and the Show islands off Tae-shan are the two Becher islets, with steep cliffs, lying close together, and also two low rocks 1½ miles North of the latter.

Vessels passing between the Show islands and East Volcano should be careful not to stand too close to the latter, as the water shoals to 2 fathoms at 1¼ miles off shore. East 3 cables from its north point is a half-tide rock, steep-to.

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* *See* Admiralty Chart:—Chusan Archipelago, North sheet, No. 1,969.

† Navigating Lieutenant W. B. Meade, H.M.S. *Kestrel*.

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Anchorage.—There are many sunken rocks among the group of islets which extend 5½ miles off the north-west face of East Volcano, among which vessels ought not to go, but they will find anchorage with shelter from northerly winds on the south side of West Volcano, the southern of the group, and the nearest to the south group of the East Volcano, the anchorage being to the northward of a flat rock, lying westward of the south point of the latter. The northernmost islet of the group has a reef lying 1½ cables northward of it.

WEST VOLCANO LIGHT.—Exhibited from a lighthouse on the western island or rock of the Volcano group, is a *fixed* white light, elevated 93 feet above the sea, which, in clear weather, should be seen a distance of 15 miles. The illuminating apparatus is of the fourth order, dioptric. The tower is of stone, 33 feet high, and painted black; and the keeper's dwelling is painted white.

Fog Signals.—In thick or foggy weather, when a vessel is known to be in the vicinity, *two guns* will be fired at *five* minutes interval between; to be repeated if necessary after a further interval of *ten* minutes.

Position.—The light tower is in latitude 30° 20′ 25″ N., and longitude 121° 51′ 45″ E.

TIDES.—It is high water, full and change, at the Volcano islands, at 11h. 30m., springs rise 15 feet. The flood sets W.N.W. and the ebb E.S.E. The velocity of the tide will be found to increase as Hang-chu bay is approached, and in light winds a wide berth should be given to all the islets hereabouts; *see* also page 406.

SKEAD ISLET, lying 4½ miles northward of the Show islands, has a smaller islet on its north-west side and another on its south-east side. The depths from 2 to 4 miles around Skead are unknown, but towards the Rugged islands to the northward they vary from 5 to 7 fathoms.

MARINER REEF, with only 5 feet on it at low water spring tides, is 200 yards long, east and west, and 17 yards broad, with 5 fathoms close around. From this reef Volcano island lighthouse bears S.W. by W. ¾ W., Skead island, S. ½ E., and Borrow head E. ¾ S.

CHIN-SAN ISLAND, 8 miles long east and west, lies W. by N. 13 miles from the Beehive rock (page 387), and 5½ miles to the north-east of Tae-shan. The channel south of this island and between it and the chain of islands extending W.N.W. from the Fisherman's group is sometimes taken during the northerly monsoon by vessels bound to Ning-po or Chusan, and it appears preferable to that through Lan-sew bay, being

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broad and clear of danger, with the exception of the Mariner reef just described. There are several islets lying off the eastern and northern face of Chin-san; there is anchorage to be obtained in the northerly monsoon westward of the south-eastern islet, between it and Worth point, Chin-san. It is not good during spring tides, as the tides run through the passage with great velocity, causing the vessel to sheer widely. Pilot boats and small craft use the anchorage, but they keep close to the islets and out of the strength of the tide. It is locally known as Worth harbour; and there is also tolerable shelter on its western side, off Pennell, the south-west point of Chin-san.

The flood tide sets round Pennell point (west end of Chinsan island) to the N.W. by N. occasionally at the rate of 5½ knots an hour.

SADDLE GROUP.—This important group of islands lies off the estuary of the Yang-tse kiang, directly in the track of vessels entering from the southward.

East Saddle, the outer southern island of the group, is 32 miles northward of Video, W. ¼ S. 16 miles from the Barren isles, and N. by W. ½ W. 17 miles from Leuconna island (page 387). South Saddle on the west and contiguous to it is rugged, the highest part, at the north-east end, rising 680 feet above the sea.

Rock.—A rock, which shows at low water, lies in the bay on the east side of the island, with the highest part of the rocky islet close to the eastern point of the bay in line with a conical hill over the west point of East Saddle.*

Eight miles north-west of East Saddle is North Saddle island, 780 feet high. Between them is False Saddle island; and south-westward of North Saddle are the Side Saddles, two narrow islets which will afford shelter, but not as good as under South and East Saddle. North Saddle forms the north end of the Chusan archipelago, and from it the Amherst rocks at the mouth of the Yang-tse kiang bear N.W. ¾ N. 26 miles, the soundings gradually shoaling from 12 to 6 fathoms.

Anchorage.—The most convenient anchorage in the northern monsoon amongst the Saddle group is under East Saddle, and in the event of being caught in a southerly wind a vessel might run between the islands, taking care to keep South Saddle close aboard, within 1½ cables, as there is a large patch of 3 fathoms occupying the centre of the channel, and three rocks awash north of it. Water can be obtained at the east end of East Saddle.

* *See* Admiralty Plan of South and East islands of Saddle Group, by Lieutenant Nolloth, R.N., 1842, No. 1,418, scale, *m* = 2·2 inches.

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TIDES.—It it high water, full and change, at an hour before noon, and the rise is 14 feet; the tides are said to be regular; the flood setting to the N.W., the ebb to the S.E.

LIGHT.—On the north-east extreme of North Saddle island there is exhibited from a lighthouse, a *revolving* white light, attaining its greatest brilliancy *every minute,* elevated 273 feet above the sea, and in clear weather visible from a distance of 24 miles. The illuminating apparatus is of the first order, dioptric. The tower, of brick, is 54 feet high, upper part black, lower part white; the keeper's dwellings are painted white. This light is visible from N. 52° W. round by West and South, to N. 73° E. The remaining angle is chiefly obscured by the Saddle and Parker groups of islands.

Fog Signals.—In thick or foggy weather, when a vessel is known to be in the vicinity, *three* guns will be fired with interval of *one* minute between first and second, and *five* minutes between second and third; to be repeated if necessary after a further interval of *ten* minutes.

CHILDERS ROCK, lying 4¾ miles South of the east part of East Saddle island, uncovers at low tides, with the Barren islands bearing E.N.E., Leuconna island S.S.E. ½ E., and the summit of Senhouse island W. by N. The lead will give no warning of approach to this danger, the depth being 24 fathoms close-to.

BIT and CAIRNSMORE ROCKS are in the channel, 4 miles wide, between the Saddles and the Parker group next westward. Bit rock, not much elevated above high water, and with a rock awash reported* to lie one cable S.E. of it, is 4 miles West of South Saddle and South of the chain of rocks and islets extending from Side Saddle.

Cairnsmore rock, a dangerous pinnacle not more than thirty or forty feet in diameter, and on which the ship *Cairnsmore* was wrecked in 1858, rises almost perpendicularly from soundings of 12 fathoms at about 2½ miles eastward of the east end of Raffles island. When examined the precise depth on the pinnacle could not be ascertained, as the wreck, with her foremast standing, quite covered it, but there cannot be more than 11 feet over it at low water springs.

From the rock, the south-east point of Senhouse bore South; a small rugged rock lying close to the south-east point of Raffles, and in line with

* Reported by Captain Dando, of the *Bombay Castle.* Captain Charles Waddilove, R.N., remarks "that, on approaching from the south, the Bit rock is not easily distinguished at first; also that it has an oval shoal extending to the south-east, and a remarkable patch of rock with one part standing upright like a mile-stone, a little to the northward of it."

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the point, S.W. by W. ¼ W.; and the northern rock of the group lying off the north part of Chesney island, N.W. by W. ¼ W.

Caution.—Vessels navigating the channel between the Saddle group and Raffles island are cautioned to keep well over towards the Saddle islands to avoid the above danger, as the lead will give no warning when approaching it. In sailing north, when the Bit rock opens south of the South Saddle they will be northward of the Cairnsmore; and in sailing south, when the same rock opens north of the South Saddle they will be southward of it.

PARKER ISLANDS.—Raffles and Senhouse Islands.—Raffles, the largest of the Parker group, bears West 11 miles from South Saddle island. Senhouse island (with steep cliffs) lies 1¾ miles south-east of Raffles; there is a good channel between them, and anchorage will be found on the south side of Raffles in the northerly monsoon.

Rock.—At half a mile from the north-east point of Raffles and 2 miles W. by N. of the Cairnsmore is a sunken rock.

Brooke, Bonham, Chesney, Elliot, and Morrison Islands.—Brooke island is a mile south-west of Senhouse island, and the channel between should not be used, as the wind is liable to fail under the latter; there is, however, a good passage 2 miles wide west of Brooke, between it and the Bonham isles, also between the Bonhams and the eastern-most island of the Davis group, which is extensively used by the coasting steamers. Extending from the west point of South Bonham island, is a reef, with a patch of 2 fathoms about ¾ of a mile from the shore. This reef is said to be increasing westward. A spit with 4½ to 6 fathoms mud, extends 1¼ miles in a westerly direction from the northernmost Bonham island. The 9 foot rock, formerly reported as being about midway between Bonham and Morrison islands, though searched for by H.M.S. *Magpie*, was not found, it has therefore been removed from the chart. Off the north end of Raffles is Chesney island, from which rocks and islets extend two miles farther northward.* North-west of Raffles, and distant from it 1¾ miles, are the Elliot islets, on the south-west side of which H.M. brig *Plover* anchored, and found fair shelter, with the wind blowing hard from the northward. From the Elliot, Gutzlaff island bears W. by N. ½ N., 10½ miles.

Morrison island, 7 miles south-west of Raffles, with smaller islands about it, is very precipitous. The south-western islet of the Parker group is

* Tonbridge rock, on which the vessel of that name was said to have struck, in the year 1872, at 2½ miles northward of Chesney island, is reported by Captain Andersen of the Chinese Imperial revenue steam vessel *Qua-hsing*, not to exist. H.M.S. *Magpie* remained at anchor near the reported position of Tonbridge rock during two spring tides, but no indication of a rock or shoal was seen.—R.H.N.

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2 miles S. by W. of Morrison ; and east of this is a chain with deep water passages between extending to Senhouse.

LIGHT.—A light is exhibited from a lighthouse erected on the southern shoulder of Bonham island, the largest of the Bonham group, Parker islands.

This light is *revolving*, showing alternate *red* and *white flashes* at intervals of *half a minute*, it is obscured by the high land of Bonham island between the bearings of S. 14° 41′ W. and S. 47° 30′ W.; and to the northward and eastward it is also obscured by Elliot, Raffles, and Senhouse islands, from S. 12° E. to S. 82° 15′ W., with the exception of rays between S. 11° 25′ E. and S. 10° 35′ E., between S. 2° 20′ E. and S. 0° 45′ E., between S. 1° 30′ W. and S. 3° 20′ W., and between S. 50° 5′ W. and S. 60° 10′ W.

It is elevated 237 feet above the sea, and should be visible in clear weather from a distance of 22 miles.

The illuminating apparatus is dioptric, or by lenses, of the third order.

The lighthouse, 47 feet high, constructed of iron and circular in shape, is painted red and white in horizontal bands ; the dwellings are white.

Approximate position, lat. 30° 37′ 21″ N., long. 122° 25′ 44″ E.

Fog Signals.—The following fog signals have also been established at Bonham island lighthouse :—

During thick or foggy weather, should a bell, fog horn, steam whistle, or other sound be heard, indicating the proximity of a vessel, *two* guns will be fired with an interval of *one minute* between them ; and if the vessel's fog signal is still heard, the firing will be repeated after an interval of *eight minutes.*

Caution.—Vessels should pass half a mile clear of the small islet lying 1½ cables westward of Bonham island, in order to avoid outlying rocks which have from 1 to 2 fathoms on them at low water.

RUGGED ISLANDS lie W.S.W. 15 miles from Raffles. Formed like a pair of callipers, 10 miles in length, and opening to the westward, the group affords shelter in both monsoons, with sufficient room to moor a fleet, but the tides set through it with considerable velocity. Tayung, on the south, the largest and highest of the group, is 660 feet above the sea, and differs from the rest by being round-topped, whereas the others are, as their name denotes, rugged, and barren. Under the south side of an islet west of Tayung is Pirate bay, which affords snug anchorage during the northerly monsoon, and a better shelter than the bay within the S.W. and N.W. horns of the group. A reef, which generally breaks, lies off the east side of Pirate bay.

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On the north side of this group the largest island is Tripoint, remarkable for its triple peak; and east of it is Spire islet, on which is a curious pinnacle. The islands are inhabited by fishermen, and the various anchorages are frequented by the trading junks.

TIDES.—The tides run with great velocity off the S.W. and N.W. Horns. H.M.S. *Sheldrake*, 1877, at anchor S.S.E. 2¼ miles from N.W. Horn, found at four days after full and change, the flood tide setting N.W. by W. at the maximum rate of 4·4 knots an hour, and the ebb E. by S. 5·2 knots.

HEN and CHICKS.—N.E. by N. 3¾ miles from the N.W. Horn of the Rugged islands is an islet having a reef running out from the north-west of it, with several rocks above water called the Hen and Chicks, these when seen from the south-west, are smooth and round, with detached pinnacle rocks to the northward.

A shoal of only 10 feet has been reported to lie S.W. 7 miles from Gutzlaff island, which would place it E. by N. ½ N. not quite 2 miles from the Hen and Chicks. The chart shows indications of a bank of 5½ fathoms, in this vicinity, extending from between 2 and 6 miles eastward of the latter, with 6 to 7 fathoms around.*

Caution.—Before the lighthouse was erected on Gutzlaff, the Hen and Chicks were once mistaken for that island in thick weather, and the vessel's course being shaped for the bar of the Yang-tse, she ran on shore near cape Yang-tse. The outlines of the two are quite different, Gutzlaff being smooth and round, the Hen square and rugged. The soundings also are different, there being 6 fathoms inside or north-westward of the Hen and Chicks, and 5 to 4 fathoms only inside Gutzlaff.

GUTZLAFF ISLAND, 210 feet high, and N.E. ½ E. 8½ miles from the Hen and Chicks, is a round, smooth-topped island, surmounted by a low lighthouse, and the most conspicuous object off the southern entrance of the Yang-tse kiang. A small islet lies half a mile N.N.E. of it.

LIGHT.—A light is exhibited from a lantern erected on the summit of Gutzlaff island. The light is a *fixed* white light, elevated 270 feet above the level of the sea, and in clear weather should be seen from a distance of 20 miles. The lantern is 24 feet high and painted white: there is no tower. The illuminating apparatus is dioptric, of the third order.

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* Partial search was made by H.M.S. *Magpie* for this shoal ground in 1881, and though the weather prevented a thorough examination, I strongly doubt its existence.—Remarks by Captain R. H. Napier, H.M.S. *Magpie*, 1881.

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Fog Signals.—In thick or foggy weather, when a vessel is known to be in vicinity, *three* guns will be fired at *two* minutes interval between them; to be repeated if necessary after a further interval of *fifteen* minutes. *Telegraph Station.*

TIDES of the ARCHIPELAGO.—In the Vernon Channel, at the south end of the Chusan archipelago, it is high water, full and change at 9h. 40m., and springs rise 14 feet; in Ting-hai harbour at 11h. 0m., springs rise 12 feet, neaps 9 feet; at Poo-too island at 8h. 15m., springs rise 12 feet; in Lan-sew bay at 10h. 0m., springs rise 13 feet; at the Volcano islands at 11h. 30m., springs rise 15 feet; and at East Saddle island at 11h. 0m., and springs rise 14 feet.

Under Luhwang island the flood sets to the N.W. at the rate of 2 knots per hour, and the ebb to the S.E. at 1½ knots. In Duffield, Gough, and Roberts passes, the first of the flood, at full and change, often comes from the northward, and sometimes runs in that direction 3 hours before the tide through Buffalo Nose channel overcomes that through the Beak Head, Vernon, and Sarah Galley channels. In Duffield pass the tide sometimes runs 5 knots; in Gough and Roberts passes it is not so strong; in Beak Head channel 4 knots is about the maximum; and in Vernon channel it has been known to run 6 knots. Off Roundabout island the tidal streams are not so violent, but the eddies take command of a sailing ship at springs.

In the southern entrance to Sarah Galley channel, between Laoush and Ousha islands, the flood ran W. by S. at the rate of 2 knots, the ebb E.S.E. 1½ knots; the moon was then 18 days old. In the Cambrian pass between Ousha and Chuken islands, H.M. steamer *Vixen*, with the *Cambrian* in tow, could not stem the ebb.

In the Tower Hill channel, as before stated (page 379), with a strong flood, vessels have been swept to the westward, and carried by the tide beyond Just-in-the-Way, and even through Blackwall channel; and after rounding Tower Hill and entering Bell channel, may have been borne by the ebb, between Tower Hill and Tea islands. Having rounded the north end of Tea island with a strong ebb, it is necessary to guard against its taking the vessel through the Melville channel, and if not able to pass northward of Macclesfield island, send the boats ahead and endeavour to keep the vessel to the northward of Sarah island, where there is shoal water to anchor. In the channel between Bell island and Chusan, the tide at times runs with great strength, so much so that on one occasion the *Madagascar* steamer had great difficulty in stemming it.

In the Blackwall channel, the eddies are as strong as they are off Roundabout island, taking a sailing ship round against both helm and sails. In

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the Kintang channel, between Kintang island and Deadman island, the tides sometimes run 4 knots.

In the northern part of the Chusan archipelago, with Lan-sew island bearing West 5 miles, the flood ran to the W.N.W. the first hour, then N.W.; total amount of tide 11 knots. The ebb, S.E. by S. the whole tide; total amount 5¾ knots.

APPROACHES TO YUNG RIVER AND NING-PO, AND HANG-CHU BAY.

KINTANG CHANNEL,* between the south coast of Kintang island (page 383), and the mainland, is about 2½ miles wide, but is narrowed to 1½ miles by an extensive mud bank which borders its southern shore,) and by a ledge of rocks extending 2 cables from Alligator point, the south extreme of Kintang, which is marked by a beacon.† This mud bank dries upwards of three-quarters of a mile from the shore, is steep-to, and the lead gives little warning; there are some small islets lying on its outer edge, near the westernmost of which is a boat creek, from thence there is a paved footpath leading to Tein-tung and so on to Ning-po, the whole distance being about 18 miles, the last 6 miles of which may be performed by canal.

JUST-IN-THE-WAY is a small islet, 20 feet high, with rocks extending 1½ cables from its S.S.E. side, lying in the eastern entrance of the Kintang channel. To the south-east, between it and Tygosan island there is fair anchorage in 12 to 16 fathoms, which will be found a convenient stopping place should there not be sufficient tide to take a vessel on to the river Yung, the anchorage outside of which is much exposed.

The DEADMAN is a square island lying W. ½ N. 2½ miles from the south extreme of Kintang and 4½ miles westward of Just-in-the-Way. The channel between it and Kintang is rather less than 1¾ miles wide, with deep water and strong tides. The Ko channel, between the Deadman and the main, is half a mile wide, but is not recommended, as the tides run with great strength, and the limit of shoal water on the south side is not well defined.

Rock.—A sunken pinnacle rock having a depth of 4 feet, and 6 to 14 fathoms close around, has been found in Ko channel between Ko point and Dumb island, about 3 miles to the eastward of the entrance of Yung

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* *See* Admiralty Chart of Kintang Channel, No. 1,770, scale, $m = 1{\cdot}2$ inches.

† *See* page 382.

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river. From the rock Ko point bears S.S.E. ¾ E. 1½ cables; west extreme of Dumb island, N.N.W. ¾ W.; south extreme of Deadman island, E. by N.

BLONDE ROCK and Beacon.—Blonde rock, a short half mile northward of the Deadman, shows at low-water springs. The marks for it are, the easternmost islet off the north-east point of the Deadman in one with Sanshan islet S.E. ¼ S.; and the west end of Dumb islet S.W. ½ W. Beacon hill, at the east side of entrance to the river Yung, in line with the citadel bearing W.S.W., leads northward of the rock. It is marked by an iron beacon with cage, painted black. From the beacon Sanshan islet bears S. 42° E., Square island, N. 65° W., and Beacon hill (in one with the citadel), S. 45° W.

TSE-LE or SQUARE ISLAND, off the Yung river is 2¾ miles N.W. by W. from the Deadman; there is a patch of 2¾ fathoms water at 6 cables S.E. by S. from its north end. H.M.S. *Conway* anchored W.S.W. of this island, with Pas-yew, the western of the Yew islands, bearing South. This anchorage in the summer season is safe, but during the autumn and winter violent gales with thick weather rise rapidly, causing an uneasy sea, in which a vessel will have difficulty in weighing her anchor; consequently, the anchorage at Just-in-the-Way or that in Ta-outse harbour, at the north-west end of Kintang (page 382), should be resorted to at this season.

SQUARE ISLAND LIGHT.—A *fixed* white light, visible all round, at an elevation of 123 feet above the sea, is exhibited from a white octagonal tower, 33 feet in height, on the summit of the island. It is dioptric, of the fifth order. The lightkeepers' dwellings are painted white. A fog bell is sounded *once* every 15 seconds in foggy weather.

PAS-YEW or TIGER ISLAND LIGHT.—A *fixed* red light, visible all round, at an elevation of 148 feet above the sea, is exhibited from an octagonal tower, painted with alternate red and white vertical stripes, on Pas-yew* isle, the western of the three islets fronting the entrance of the river Yung. The light is of the sixth order, dioptric. A gong† is sounded during foggy weather, giving five strokes in quick succession, at intervals of about *one minute.* The tower is 30 feet in height. The light-keeper's dwellings are also painted in red and white vertical stripes.

YUNG RIVER‡ has its entrance fronted by three islets, called the Yew islands or Triangles, which form three passages into the river. The

* Pas-yew is called Tiger island in the Chinese Official List of lights, buoys, and beacons, corrected to December 1883.

† *Ibid.*

‡ *See* Admiralty Chart of Yung River, No. 1,592; scale, *m* = 3 inches.

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town of Chin-hai is built close to the south-west side of Citadel hill, on the western side of entrance to the river, of which it is the maritime town. From Chin-hai the river trends in a S.W. and West direction for 11 miles to Ning-po fu, and is about 2 cables wide, with depths varying in mid-channel from 5 to 2 fathoms. Vessels of 17 feet draught can proceed up to the city from Chin-hai at springs, at half-tide, and anchor off either face of the foreign settlement. European pilots can be obtained at Chin-hai.*

The Yung separates into two branches at Ning-po fu. That from the north-west, is a large stream running down through the districts of Yu-yao and Tsie-kie, and is variously called the Yu-yao or Tsie-kie branch and the Shun river; the other, the Funghwa branch, is from a S. by W. direction, is barely a cable wide, and is crossed by a bridge of boats at a quarter of a mile above the junction. As the turning at this junction, from the river Yung into the Tsie-kie branch, is very sharp and difficult to take, owing to the crowded state of the river and the flood stream setting up the Funghwa branch, large vessels should anchor below it and wait until it is clear of the native shipping. The British Consulate is situated on the left bank of the main river below the Suayo and Tsie-kie branch, about a quarter of a mile S.S.W. of the English cemetery.

Anchorage.—The usual anchorage for ships-of-war is near the left bank of the river opposite the British Consulate, in a depth of 4 fathoms.

A bridge of boats over the Suayo and Tsie-kie branch is formed of pontoons; any of the middle ones can be moved by giving notice for passage of small craft.

CITY of NING-PO.†—The Chinese city is immediately above the junction, its walls extending along the river side up both branches. It is governed by a Tao-tai, who is also Superintendent of native Customs. Its population (numbering in 1874 about 300,000) are industrious, enterprising, intelligent, and mild in disposition.

Trade.—In the year 1881, 1,048 vessels entered and cleared the port, representing 656,376 gross tonnage. The principal imports consist of cotton and woollen manufactures and opium, also of dried fruits, metals, rattans, drugs, oil, tobacco, sugar, sandal wood, &c. amounting in the same year to 2,510,391*l*. The exports consist chiefly of green tea, raw silk and cotton, and copper cash, also of wheat, rice, fish, medicines, &c. amounting to 1,315,839*l*. The gross value of the trade of Ning-po being 3,908,005*l*. Five-sixths of the trade is carried on in the daily steamers running

* In the Yung River the shoalest water will be found about 1 mile below Pawnbrokers; here, there is 9 feet at low water spring tides.—Remark book of W. O. Thorburn, Navigating Officer H.M.S. *Sheldrake*, 1882.

† There is a mud dock 160 feet long, 33 feet wide, with 7½ to 9 feet on sill.

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between this and Shanghai. The "China Merchant's Company" (Chinese), and the "China Navigation Company" (British), send each a steamer on alternate days, omitting Sundays, the first named running a steamer of over 1,000 tons, and the latter one of 600 tons.

The Climate and meteorology of Ning-po differs in no important respects from that of Shanghai (*see* page 445). A greater degree of salubrity prevails here, owing probably to the water in the river being salt instead of fresh, and consequently less conducive to malarial exhalations. Its advantage over Shanghai as a place of residence for Europeans is its proximity to the sea, and the neighbourhood of numerous hilly regions where pure air and moderate temperature can always be enjoyed.

Supplies.—Native shops established in various parts of the settlement supply foreigners with provisions at prices more moderate than at Shanghai. Game is plentiful during the winter, and fish (including mackerel), are to be obtained of superior quality, and in great abundance.

TIDES.—At Chin-hai it is high water, full and change, at 11h. 20m., and springs rise 12½ feet. At Ning-po fu it is high water at 1h. 0m., and springs rise 9 feet.

DIRECTIONS.*—A vessel bound from Ting-hai harbour, Chusan to the river Yung, should, after clearing the Bell channel, steer W. by S. for Just-in-the-Way, recollecting that the south-east face of that islet is foul, and that a reef extends a cable's length from Insular point, the north extreme of Tygosan. As before stated (page 398), if the tide should fail, there is fair anchorage to the south-east of Just-in-the-Way. From hence the peak of Tower-hill island in line with Insular point will lead southward of the rocks off Alligator point, after which keep over towards the Kintang shore, until well past the Deadman, or until Beacon or Look-out hill at the eastern point of entrance to the river Yung is in line with the citadel W.S.W., which will lead northward of the Blonde rock, and southward of the 2¾ fathoms patch lying S.E. by S. 6 cables from the north end of Tse-le.

It will be prudent for a stranger before entering the river Yung, if unable to obtain a pilot to examine the entrance, for since the last survey of this

* The bends of the river are sharp. The north bank of the river is steeper-to than the south, and great caution is necessary at the entrance, owing to the number of junks, the set of the tides, and to the water being less than formerly. Four miles from Chung point (towards Ning-po) keep to the north bank. Shoal water (1¼ fathoms) extends at least 1¾ cables from the south bank, for a distance of 1¼ miles. The passage to the westward of Pas-yew island is recommended for a small ship, the bottom being even, and not less than charted.—Remark Book of C. H. Hopkins, Navigating Lieutenant H.M.S. *Thistle*, 1877.

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river the stakes and sunken junks which blocked the channel between the citadel and Peak islet have been removed, and this may have caused some change in the mud banks and soundings outside.

The Yew islands, as before stated, form three passages into the Yung river. The eastern passage is between the islands and Look-out hill, the east point of entrance, and the first danger in it is the Nemesis rock, which lies E. by N. ¾ N. a quarter of a mile from the summit of Ta-yew, and is covered at half-flood. By keeping Pas-yew open of the south point of Ta-yew, this danger will be avoided.*

Beacon.—Nemesis rock.—On the ledge of rocks extending from the N.E. point of Ta-yew island, consists of a hard wood spar painted *red* with an inverted frustum cage painted *white*.

Having passed the east point of Ta-yew, keep it and Seaou-yew aboard, to avoid the Sesostris rock, with only 9 feet on it, lying in mid-channel, until Peak islet (a remarkable rock on the east side of the river opposite the citadel) is in line with Cone hill bearing S.W. ¼ S., which leads westward of the rock.† From the rock the Friendly islands (7 miles north-west of Chin-hai) are in one with Talung island (a high bluff island beyond it) bearing N.W. ½ W.

Buoy.—Sesostris rock.—A buoy chequered *black* and *red* and surmounted by a black cage has now been placed in 5 fathoms water, near and to the eastward of the rock.‡

Having cleared the Sesostris, steer to pass between half and 1½ cables southward of Pas-yew, and then for the point under the citadel, taking care that the tide does not set the vessel over to the eastern bank of the river, where the water shoals to 2 fathoms at half a mile off shore.

Seaou-yew Spit and Buoy.—The middle passage, or that between Seaou-yew and Pas-yew, is probably the best of the three. A mud spit, the extremity of which is marked by a *black* buoy, surmounted by a *black* cage, extends north-westerly 1½ cables from the west end of Seaou-yew, and shoal water, 3 fathoms, some distance beyond it, this bank is stated by Navigating Lieutenant F. J. Harwood (H.M.S. *Swift*, 1882) to have extended, the former marks being no longer any guide. From the Buoy, Tiger island lighthouse bears S. 23° W., and the N.W. point of Ta-yew island N. 75° E.

* The pilots always use the eastern channel with strong tides, and recommend passing *south* of the Sesostris rock.—Remark book of Navigating Sub-Lieutenant J. Fowling, H.M.S. *Swinger*, 1876.

† The merchant barque *Moltan* is said to have struck on a rock having 9 feet on it and 18 feet close-to, lying with Friendly island just showing northward of Pas-yew, and the northern extreme of Look-out hill bearing East.—*Nautical Magazine*, 1852.

‡ Chinese Official List, 1884.

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The passage between Pas-yew and Chung point under the Citadel, has 2 fathoms in it at low water, and is the broadest and best for small vessels when the tide has risen sufficiently high for them to enter; the only danger being the Tigers Tail rock which covers at high tide, and lies rather more than a cable N.W. ½ N. from the summit of Pas-yew, with the south-east foot of the citadel hill in line with Cone hill bearing S.S.W. ¾ W.

Tiger's Tail Beacon.—The rock is now marked by a beacon, of iron, painted black, and surmounted by a white cage. The beacon bears N. 43° W., 210 yards from the tower on Tiger island.

Chung point is steep-to on its east side, and vessels will find good shelter under the fort.

Fishing stakes are moored to the west side of Peak island in deep water. The bend of the river above Chin-hai is often rendered most difficult to navigation by the immense number of junks at anchor there or dropping with the tide. The passage between them is left so narrow that the greatest caution is necessary to avoid collision. Above Chin-hai, keep mid-channel, giving the points a good berth. Vessels drawing 12 feet water should go up on the flood, as they are liable to take the ground in many places.

The COAST from Chin-hai trends in a north-west direction, and is fronted by a mud bank which dries at low water for nearly three-quarters of a mile from the sea embankment, and is steep-to. At the distance of 7 miles from Chin-hai, and three-quarters of a mile from the shore, is a group of five islets, named Friendly islands, inside of which there was shelter in 3 fathoms at the time of the survey, but the water is said* to be shoaling fast. Take care when rounding the west end of the largest islet to avoid a spit extending 3 cables to the S.E. from it.

At 4 miles farther to the north-west is Talung island, a high bluff, 920 feet high, forming the southern horn of the Tsien-tang estuary, or Hang-chu bay.

CAUTION.—From Talung the coast trends more to the westward, and for upwards of 30 miles is fronted by a drangerous mud bank which, at the distance of 8 miles from Talung, dries 7 miles off shore, and on its edge are some small knolls. The *Kite* transport was lost upon this bank in 1840, the tide, which here begins to increase its velocity to 6 knots at the springs, turning her over the moment she tailed on it.

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* Commander T. H. Mason, R.N., H.M.S. *Medea*, 1849.

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MIDDLE GROUND.*—N. by W. 3½ miles from Tse-le island (page 399) is a Middle ground with less than 2 fathoms on it, to avoid which vessels in proceeding to the northward from the river Yung, must keep over towards the Kintang shore, and if drawing 18 feet water, should not bring Tse-le to the southward of S.S.W. There is a passage to the southward of this Middle ground for vessels of 15 feet draught, but there are two patches, on which H.M.S. *Contest* grounded, lying in a N.W. direction from Tse-le, one with 12 feet on it at 9 cables, and the other with only 5 feet at 2¼ miles from the island.

NANHO or South island, bearing N. ¾ W. 14¼ miles from Tse-le, is the outer and largest of the first group of islands met to the westward when steering to the northward from Chin-hai; it is flat-topped, 216 feet above the sea, three-quarters of a mile in extent east and west, and cultivated. As the water deepens close around this island to 26 and 32 fathoms, vessels cannot anchor near enough to get shelter, but the holding ground is good. About half a mile north of it is a small rock which always shows.

WEST STORK is a small islet lying W. ½ N. 3¾ miles from Nanho, and there are 8 and 9 fathoms water between them.

SEVEN SISTERS ISLETS, 2 miles farther west, lie north 9 miles from Talung island, and although small, will afford shelter from northerly winds. The channel between them and the dangerous mud bank just described, is 4 miles wide, and the depth in it varies from 6 to 2 fathoms, shoaling towards the bank. A reef shows at low water, at half a mile N.N.W. of the western islet; and a shoal of 2 to 3 fathoms extends 4 miles north-westward from it.

SESHAN ISLANDS form three distinct groups. East Seshan, the easternmost group, lies North 18 miles from Nanho island, and consists of one island about 400 feet high, with six islets around it. Middle Seshan island, lying 6 miles W.N.W. of East Seshan, is the largest of a straggling group consisting of eight other islets, the southernmost of which is a small rock nearly awash, at nearly 4 miles south-east of the highest; the western islet, House islet, is an abrupt cliff with a house on its summit. Neither of these two groups are sufficiently large to afford shelter; but fair anchorage will be found in the neighbourhood of the three islets forming the West Seshan group, at 10 miles W.N.W. from Middle Seshan island.

* This middle ground is said to have extended considerably to the eastward. In latitude 30° 4′ N., longitude 121° 46′ 45″ E., soundings of 3 fathoms were obtained at one and a half hours before low water spring tides.—Sub-Lieutenant W. O. Thorburn, R.N., H.M.S. *Sheldrake*, 1882.

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FOG ISLETS.—In the centre of Hang-chu bay, at 14 miles W.S.W. of Middle Seshan island, are five low rocky islets, the depths of water about which is 5 to 6 fathoms.

CHAPU is a town of considerable importance, standing in a bight on the north shore of Hang-chu bay, 17 miles south-west of West Seshan. It is the port of Hang-chu fu, and the only one from which the Chinese carry on trade with Japan. It will be readily known by the hills in its vicinity, as well as by the islets which protect the roadstead off it from the eastward ; on the eastern of these islets is a remarkable white house.

The town* lies at the bottom of a bay on the western face of the hills forming its eastern point, and at low tide the mud runs off a long way from the low land lying between these and some distant hills whose tops are covered with buildings. The suburbs are situated near the western extremity of a small headland which runs back 4 or 5 miles and lines the beach on both sides, the central part being hilly ; the walled town stands about half a mile behind.

Vessels steering for this roadstead should round the southern islet at about a quarter of a mile and haul up for the houses which will be seen westward of the hills. The anchorage is sheltered from E.N.E. to S.S.W.; but the tide runs 5 knots at springs, and the rise and fall is 25 feet. The mud dries half a mile from high-water mark, is steep-to, and the lead gives no warning. At 4 miles southward of the southern islet is a shoal on which the ship *Bentinck* tacked in 3 fathoms, and where there is probably less water ; should the tide therefore set vessels in this vicinity, it will be prudent to anchor.†

In the southern bight of Chapu bay, 11 miles from the town, are some islets and a pagoda. At 18 miles south-west of Chapu there is a bay, protected in some measure by a small islet, in which several boats were lying aground. On the hill over it was a four gun battery and a numerous garrison ; this place, answering to the name, is supposed to be the Canpu of Marco Polo. Tseenshan, at 24 miles, south-west of Chapu, appeared to be an islet connected with the main by a causeway ; on it was a four-gun battery and a small pagoda about 60 miles from the city of Hang-chu. The depth of water at this place across the estuary at low tide was found to be less than 1½ fathoms.

WAN-TAO-KWAN‡ is situate in a small bay westward of the second point of land, about 20 miles south-westward of Chapu. Off the

* Williams's *Middle Kingdom*.

† *See* Admiralty Plan of Chapu Road, No. 1,453, scale, $m = 2$ inches.

‡ Abridged from the Remark Book of Com. C. M. Buckle, R.N.

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point are two small islands, between which and the point is a narrow passage carrying 4 to 5 fathoms at low water, but which can only be passed through at slack water on account of the extraordinary velocity of the tide. From outside the islands, a bank extends for half a mile from high water mark, over which there appears to be an eddy tide, and here the junks (which freely make use of the anchorage, judging their time for going in and out according to the tide) moor. At 5 days after full moon, the strength of the flood stream at the outer anchorage off Wan-tao-kwan was 8½ knots, and the ebb 7½ knots; and the rise is probably 30 feet.

In August 1865, Wan-tao-kwan, being a rendezvous of pirates, at that time in the hands of the Tai-ping rebels, Commander C. M. Buckle, R.N., was ordered there in H.M.S. *Cormorant*, accompanied by three gunboats, and having at Ning-po engaged the services of a pilot acquainted with Hang-chu fu, proceeded to attack the place and capture the piratical junks lying at anchor, protected by a fort of six guns. The *Cormorant* was compelled to anchor in the strength of the steam outside the islands, whilst her cutter and the gunboats proceeded to attack the junks. A bombardment was kept up until dark, and it was intended to destroy the junks in the morning, but in endeavouring to bring the *Flamer* gunboat to anchor on the flood, both cables parted, and she was drifted up the bay, and in about forty minutes drove with great force upon a reef, where the tide could not have been less than 10 knots; but she subsequently floated without damage, and was drifted helplessly up the bay about 8 miles. Towards daylight sufficient steam was raised to make headway as the tide slackened, and the *Cormorant* was reached at 7 a.m. To all appearance the bay was navigable for a considerable distance up on the north side, but in the middle and on the south side extensive mudflats were seen. It is probable that no vessel less flat-bottomed than a gunboat could touch the ground in such a current without imminent danger, as the incident related on page 403 only too plainly testifies.

DIRECTIONS.—When bound northward from the river Yung endeavour to leave with the first of the flood, and when northward of Tse-le island, if drawing more than 18 feet, do not bring that island southward of S.S.W., then in line with Look-out hill, to avoid the Middle ground. In working up for the East Seshan group some casts of 3½ and 4 fathoms were obtained with the eastern islet N. by E. 8 miles; it is therefore advisable that vessels of large draught should not stand into Hang-chu bay unless bound for Chapu road, in which case pass about 3 miles southward of East Seshan, and steer for the south islet of the Middle Seshan group. After passing West Seshan the low land on the north side of Hang-chu bay will be seen, and to the southward the Fog islets, a group of five low rocky

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islets bearing W. by S. ⅛ S. 14 miles from Middle Seshan, the depth about them being 5 and 6 fathoms.

If bound for the Yang-tse keep eastward of the Seshan islands, steering between East Seshan and Rugged islands. The tides in the vicinity of the Volcano islands will be found to have increased their velocity, the flood sitting W.N.W., the ebb E.S.E. Rugged islands (page 395) afford shelter in both monsoons, but the tides set strong through them. From thence steer to pass on either side of the Hen and Chicks, recollecting the 10 feet shoal (page 396); it will be prudent, if the vessel is of large draught, to pass eastward of Gutzlaff island, as a bank of only 2½ fathoms water is said to extend a mile from its western side.

TIDES.—It is high water, full and change, at the Seshan islands at 11h. 45 m., and springs rise 14 feet; at the Fog islands in Hang-chu bay at the same time, and the rise is 17 feet; in Chapu road at noon, and the rise is 25 feet.

The tidal stream increases in strength as Hang-chu bay is approached; near Nanho island and the Volcano group, the flood runs W. by N., and the ebb E. by S. sometimes 3 knots, and in light winds, unless great care is taken, vessels are liable to get entangled among the Dunsterville or Volcano groups. At the Fog islands, the rate increases to 4½ knots, at Chapu to 5 knots; and in the south-west part of Chapu bay to 7 knots with a rise of 35 feet. At 25 miles above Chapu, the tide was found to run 11 knots at springs, and 8 knots at neaps, with a rise and fall of 40 feet. In the vicinity of East Seshan, and of the Rugged group, the flood runs 2½ and 3 knots; south of Gutzlaff the first of the flood makes to the southward of West.

HANG-CHU FU, the capital of the province of Chehkiang, stands on a plain about 2 miles from the north bank of the river Tsien-tang, 20 miles above its entrance and 80 miles from the sea.* The velocity of this stream indicates a rapid descent of country from the hills which supply its head waters; the tide rises 6 or 7 feet opposite the city, and, it is said, about 30 feet, within its entrance. Captain Collinson, when making some explorations of its mouth, in order to ascertain the practicability of an approach to Hang-chu fu, found the tide to run 11½ knots an hour, and although the steamer had an anchor down with a whole cable, having previously lost an anchor and cable when she endeavoured to bring up, and was under her full power of steam with sails set, she was still driving.

The peculiar phenomenon of the eagre occurs off the city, the first of the flood coming up in a huge smooth wave, six to twelve feet in height.

The southern termination of the Grand Canal is at Hang-chu fu, but it has no opening into the river; there is also continuous water communi-

* Williams' *Middle Kingdom*, vol. i., page 95.

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cation with Shanghai, and also, through Shauhing fu and Yuyau, with Ningpo.

The celebrated traveller Marco Polo, judging from the comparative poverty of European cities of his period, describes Hang-chu fu as pre-eminent above all other cities of the world in point of grandeur and beauty, a chief feature of which is its magnificent lake surrounded by lofty mountains. It was the metropolis of China during the Sung dynasty, and maintained its splendour until Nanking was made the capital. Its chief manufacture is silk.

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CHAPTER VIII.

THE YANGTSE KIANG

AND ITS APPROACHES, INCLUDING THE WUSUNG RIVER, AND THE TREATY PORTS OF SHANGHAI, CHINGKIANG, WUHU, KIUKIANG, HANKAU, AND ICHANG.

VARIATION in 1884.
Entrance of river 2° 20′ W.; Shanghai 2° 15′ W.; Nanking 1° 40′ W.; Hankau 0° 30′ W.

GENERAL DESCRIPTION.—This noble stream, which ranks first amongst the rivers of the Old world, and next only to the Amazons and Mississippi in the New, is alike the most useful and important of the rivers of China, and constitutes one of the chief elements in the prosperous development of its commerce; whilst it has also become, during the short period that has elapsed since its opening to foreign navigation, a highway of the highest importance to European trade. Its sources, though hitherto unvisited by scientific explorers, are known to exist among the mountains of Tibet, on the eastern side of those ranges, from the western declivities of which the Brahmaputra and the great rivers of Burmah and Siam take their rise; whence the river, called the Muhlusu, flows in a south-easterly direction for upwards of 1,000 miles, and being joined by a large tributary, the Yalung kiang in Yunnan, it turns suddenly to the north-east and east through the central regions of the Chinese empire, traversing its entire breadth in a course, inclusive of its windings, of fully 3,000 miles, from the remote province of Sz'chuen to the Eastern Sea, and discharges itself at a point 1,900 miles in a direct line from its source.

The Yangtse receives various names in its course, but it is difficult to decide their limits. Above the Tung-ting lake it takes the name of Kin ho (Golden river), or Kin-sha kiang (Golden sand river); thence to Hankow or the Poyang lake, the name of Ta kiang or the Great river; whilst its lower part is called the Yangtse kiang, (derived from Yang-chow, the ancient name of the province across which it flows to the sea,) the name now universally adopted by foreigners. It is generally known to the people as the Kiang, or the River, a name it gives to three provinces.

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From its central course through the empire, and the number of provinces through which it flows, it has also been termed the Girdle of China.*

No river in the world excels the Yangtse in the arrangement of its subsidiary streams, some of which are themselves large rivers, by which the whole of its basin is rendered accessible, and no interruption of importance is experienced by falls or rapids. The basin drained by it, estimated at 750,000 square miles, comprises the whole or part of nine provinces, the productions of which are great in variety and vast in amount. Nearly 1,800 miles of the river have now been surveyed, or two-thirds of its entire length, viz., 200 miles from the sea to Nanking, by the British fleet in 1842; 400 miles farther to Hankau, by the expedition accompanying His Excellency the Earl of Elgin in 1858; thence 124 miles to Yohchau on the Tung-ting lake, by that under Vice-Admiral Sir James Hope in 1861; and further explored for 1,100 miles to Ping-shan in the province of Yunnan, in long. 104° 25′ W., by the enterprising traveller Capt. Blakiston, R.A., and his party, March to June 1861, 360 miles of which has been subsequently surveyed, as far as Kwei-chau fu in lat. 31° N. long. 109° 34′ E., by Sub-Lieutenants L. S. Dawson and F. J. Palmer, R.N., in April 1869.

Treaty Ports. — The treaty ports on the Yangtse at present open to foreign commerce are six viz., Shanghai, Chinkiang, Wuhu, Kiukiang, Hankau, and Ichang, at the respective distances of 60, 193, 289, 480, 600, and 965 miles from the sea. Consular officers are stationed at these ports, at each of which is a concession for the residence of foreigners.

Rise and Fall of the River.—The Yangtse is subject to great periodic changes of level. It has been thus described:†—"The waters begin to rise early in the year (February or March), and attain their highest level in July or August, at which season the higher portions of the river assume the appearance of an immense lake, by the inundation of the low lands. No banks are visible, junks and boats of all descriptions are seen sailing over what in the chart is dry land. At many parts between Nanking and Hankau, it exceeds 20 miles in breadth, and sometimes no land can be seen from the deck on either side as far as the bases of the distant hills bounding the horizon, on which the sun is seen to set. The houses to the very roofs are under water, and for miles only the roofs and trees are visible, the inhabitants of the villages encamping on the hills till the waters recede. On the 23rd of August 1862 the water had fallen 7 feet, and the people were returning from the hills opposite Niang-

* William's *Middle Kingdom*, vol. i., p. 18; and *Treaty Ports of China and Japan*, p. 414.

† W. W. Palmer, Commander of the ship *Fernandez*, August 1862.

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shan-ki, in Wild Boar reach, and cultivation had just commenced." From this time it would appear the waters recede gradually until the end of January, when the river is at its lowest level, and to that which the soundings on the Admiralty charts refer. The winter levels vary about 3 feet; the summer levels have a greater range.*

The height of the summer above the winter levels may be considered to be for Nanking 12 feet, Kiukiang 30 feet, and Hankow 40 to 50 feet. At Kiukiang, the rise was 21 feet† between March and June, at Yohchau 20 feet.‡

The strength of the current above Nanking is estimated at an average of 3½ knots from November to March; above Hankau, in March 2 knots, in June 4 knots, and in July is said to reach 7 or 8 knots, but this is probably an over estimate. A good local knowledge enables vessels of light draught to avoid the strength of the current by passing over the submerged lands at this season; and the strength of the current is then the best guide for the deep-water channel of the river. The navigation at this period is said to be very difficult, but the proficiency of the river pilots has reduced the number of accidents to a minimum, and they are now comparatively rare.

NAVIGATION of the YANGTSE.—The essential features of the Upper Yangtse, as regards navigation, alter so rapidly§ that a chart, unless constantly under correction, soon becomes valueless, and cannot be considered a safe guide for certain localities after the lapse of six months or a year.

In the months of September and October the river is not difficult to navigate‖ if proper care and caution are employed, the water being then many feet higher than its winter level. In September it commences to fall, and in November and December sinks very rapidly eight or ten inches a day, on account of which these two latter months are considered the most difficult period for navigation, for the bed of the river becomes altered by the summer inundations and rapid currents, so that if a vessel having touched the ground be not floated off at once, there is great probability of her remaining aground until the water rises in the ensuing spring. It is, therefore deemed imprudent to attempt the navigation of the river at this season without a pilot.

In those years when the winter levels stand highest, it by no means follows¶ that there is a greater depth of water in the channels of the river,

* *See* further remarks on this subject in subsequent parts of this chapter.

† H.M.S. *Havoc*, 1861. ‡ Capt. Blakiston, R.A.

§ J. M. Hockly, Esq., Master, R.N. Harbour Master of Shanghai, 1866.

‖ Lieutenant Ellwyn, R.N., H.M.S. *Slaney*, 1868.

¶ Remark Book of Commander Thomas M. Maquay, R.N., H.M.S. *Ringdove*, 1871.

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in fact, the contrary is the case. In 1870–71, the winter level was 3 feet higher than in the four previous years, but notwithstanding steamers experienced greater difficulty in getting up to Hankau, the depth of water being less. This apparent anomaly appears to be caused by exceptional inundations (as in 1868 and 1869), which bring down an excessive amount of alluvial matter, which is deposited in the bed of the river when the waters recede; and observations made at Kiukiang in 1870 and 1871, proved that the bed of the river rose as the water fell. The winter of 1869–70 was the first occasion on which steamers, except of the lightest draught (say, 6 feet when unloaded) were unable to reach Hankow, although during the previous winter there had been a greater depth in the various channels than for some years past. It had till then been considered that vessels of 14 feet draught could go up to Hankau at any season, using ordinary precaution in passing the bars, and vessels of 20 feet previous to November, also that vessels of the largest draught reach Nanking at any time.

In the higher parts of the river, where its width becomes narrow and the current is strong, it is of consequence that vessels of small steam power should keep as close in to the river banks as possible, in which case the lead will be found a good and sufficient guide when going against stream; but in going down the river it is better to keep in mid-channel, whereby much risk is avoided and the current taken advantage of.

Lieutenant and Commander Carey, R.N. of H.M. Gunboat *Moorhen* writing in 1879, states that: "from Wuhu to Hankow the passage would be performed with great risk without a pilot at any time of the year; from Chinkiang to Wuhu, the charts are a sufficient guide." Small steamers may take all the short cuts from June until the time the waters commence to fall.

CHANGES of the RIVER.—As might be expected in the estuary of a river draining so vast a country and subject to periodic inundations, considerable alterations are ever taking place in its bed at certain, but now, well-known localities. The most constant part of the river is the entrance of the Southern channel, for beyond some slight extension of the bar seaward no alteration of any consequence has taken place for many years; but the channel from abreast House island to the mouth of the Wusung river has undergone considerable change. The Beacon spit has disappeared, and the Block-house shoal shifted in position, and produced a straight, deep, and clear channel of some 2 miles broad.*†

For 50 miles above the Wusung river, especially at that part known as the Langshan crossing, the Yangtse is in a state of almost constant change,

* Captain R. H. Napier, H.M.S. *Magpie*, 1880.

† Except in the locality of Block-house shoal where the recent formation of a new shoal has narrowed the channel to 8 cables (see page 424).—R. H. N., 1884.

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where the river opening out from four to a breadth of nine miles, vast flats and middle grounds are formed, which are constantly shifting their positions. Under such circumstances the Admiralty charts, unless containing the latest corrections, must be considered only as a general guide in indicating the principal features of the banks and channels; but it may nevertheless be regarded as a perfectly correct guide in making the entrance and for the navigation of the river, as far as the Bush Island buoy.

LIGHTS of the YANGTSE.—The approaches to the Yangtse are finely lighted. The North Saddle light (more fully described on page 393) is of the first order, *revolving* every minute, visible 24 miles, and can be seen in clear weather as far as the outer limit of the bar, about 14 miles below the light vessel; it dips also at the Amherst rocks. The Shaweishan light, also of the first order, (page 416) *fixed* and visible 22 miles, is not in sight from the edge of the South bank, and will not ordinarily be seen when standing into the river from the south-eastward, until a vessel is well on the bar, and in the fairway. Gutzlaff light (page 396) is of the third order, *fixed*, visible 20 miles, and can be seen all over the entrance, though not powerful enough to extend its rays to the Amherst and Saddles, which are within its radius of vision. The Tungsha light-vessel (page 422) carries a light *revolving* every ½ minute, visible 11 miles, which will come in sight on entering, and four miles beyond the radius of the North Saddle light; if standing N. by W. from Gutzlaff, it will be seen when 12 miles from that island, and if standing N. by E. at 16 miles. Within the entrance are the following:—The Kintoan light-vessel (page 422) carrying a *fixed* light, visible 11 miles, situated 2½ miles E.N.E. of Kintoan beacon. (This light should be seen, when the Tungsha light-vessel has been passed 4 miles, and remain in sight until within 5 miles of the Wusung bar.) Kintoan small beacon light (page 422) 6 miles to the N.W. of Kintoan beacon, *fixed*, of the sixth order, visible 5 miles, and showing all round except landward. The Lismore wreck light vessel (page 435) on the Wusung outer bar. And lastly, the Wusung light, exhibited from a lighthouse; white, green and red (for description of which see page 436.)

ESTUARY.*†—The estuary of the Yang-tse-kiang is 70 miles broad from north to south; the delta, 60 miles in extent, is divided into two

* *See* Admiralty charts:—Islands between Formosa and Japan with adjacent coast of China, No. 2,412; Hong-Kong to gulf of Liau-Tung, No. 1,262; China, east coast, sheet viii, Hieshan isles to the Yang-tse-kiang, No. 1,199; Approaches to the Yang-tse-kiang, No. 1,602; also plan of Yang-tse-kiang, from the Sea to Nanking, No. 1,480.

† The succeeding descriptions, and directions for the entrances to the Yangtze-kiang, the Wusung river, and the Bush Island Channel (as far as page 450), are chiefly from the reports of Captain R. H. Napier, R.N., of H.M.S. *Magpie* (1880), based on the extensive survey executed in 1879–1880.

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almost equal portions by the main stream of the river; the northern part (Tsung-ming island) is 40 miles long in a W.N.W. and E.S.E. direction, 5 to 10 miles broad, containing a population of about half a million although in the fourteenth century it did not exist above water. There is no large city on the island, but many agricultural settlements, and along the coast fishing villages. The shore is intersected by numerous creeks.

Tung-sha banks, lying south-eastward of Tsung-ming island, form the southern portion of the delta.

The Yang-tse-kiang enters the sea by three channels, two only of which are navigable.

North Branch, which has only a depth of 4 to 5 feet at low-water springs, is situated north of the north-west extreme of Tsung-ming island, it is but little known and only available for junks.

Shaweishan or North channel with a bar carrying 16 feet water, is clear of danger.

South channel, through which the greater portion of the carrying traffic is conducted, has 20 feet least water over the bar, and its importance is increased by its being the nearest and most convenient approach from the southward to Shanghai, which is situated on Wusung or Wongpu river, a tributary of the Yang-tse-kiang, discharging into South channel about 40 miles from the entrance.

Great Yang-tse bank.—Extending seaward in an easterly direction from the entrance to the Yang-tse-kiang for 150 miles, is a vast bank of clean river sand, about 30 miles in breadth. It lies rather off the northern entrances, and is composed of grey or dark speckled fine sand, with a depth over it varying from 13 to 20 fathoms; the bottom near this bank is chiefly mud, or mud and sand. When more fully examined it will no doubt be a good guide to vessels making the Yang-tse-kiang from the eastward. South of this bank a deep water gully, of from 25 to 30 fathoms in depth, runs up towards Shaweishan island from the south-eastward, terminating at 20 miles E. by S. of that island. The water north of the bank is also deeper, but it shelves gradually to the north-eastward.*

North Entrance, which, in 1842, was situated in lat. 31° 50′ N., long. 122° 0′ E., has never been examined since that date, when it was only partially surveyed. It leads into the Yang-tse-kiang, north of Tsung-ming island, where the river flows into the sea by what is known as the North Branch. It is exceedingly probable that the banks and channels in this locality have entirely changed since the last examination, and on no account

* The breakers said to have been seen from the steam vessel *Costa Rica*, in lat. 32° 10′ N., long. 125° 3′ E., have been carefully searched for, but not found; 25 fathoms were obtained on the spot, with tolerably even depths all round, in a space of 15 miles square.

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should vessels approach it, even in the finest weather, under a depth of 8 fathoms.

SHAWEISHAN, or NORTH CHANNEL.—Shaweishan channel is bounded to the northward by the island of Tsung-ming and the large sandbanks extending eastward from Drinkwater point, and to the southward by Tung-sha banks, and the shallows and swatchways extending westward from thence to Middle and Bush islands.* In the centre of the channel (where there is the deepest water) the bottom is chiefly composed of mud, or mud and sand, while on approaching the banks, sand alone will usually be obtained. The water shoals somewhat gradually on the north side, but the Tung-sha banks are exceedingly steep-to. This channel has an uniform breadth of fully 2 miles, and carries a depth of from 4 to 8 fathoms from Bush island, until 4 miles west of the Fairway buoy; from thence it narrows and shoals gradually to 19 feet water, until the west limit of the bar is reached. Bush island shoals, formerly lying off Bush island, have disappeared, and of the five islands or dry banks existing in 1869 along the south or right bank of this channel, between Block House island and the entrance, but two remain, one small sand bank, which dries 2 feet at low-water springs, bearing E.N.E. distant 3¾ miles from the centre of Block House island, and to the eastward, instead of the two long islands or banks formerly existing at 13 and 17 miles respectively W. by S. from Shaweishan island, there is one large sand bank which uncovers, bearing W. by S. distant 13 miles from Shaweishan island. To the eastward of Bush island, however, silting has taken place to a considerable extent, two new islands have formed,† and a third (Duck swamp) is in progress of formation. Between the eastern extreme of this latter and Block House island, a channel has opened, leading almost direct from Wusung outer bar to Drinkwater point, and which, if properly buoyed, should prove valuable to vessels of light draught.

SHAWEISHAN ISLAND bears N. 24° W. distant 17 miles from Amherst rocks; it is a small steep-sided island, 196 feet high, fronting the entrance of the Shaweishan channel to the Yang-tse-kiang, and surmounted by a lighthouse. When bearing S.S.W. it makes as a flat-topped island with the highest part to the eastward, and when bearing West as a peaked island; when bearing N.W. ½ W., distant about 5 miles, it appears

* Coming from the eastward, the water in the vicinity of the Middle ground, which has formed 2½ miles, N. by E. ½ E. from the N.W. end of Bush island, shoals suddenly from 5 to 2 fathoms, and at very low-water the mud is visible, the north-western limits of this Middle ground have not yet been determined, the bottom is hard mud.—Abridged from U.S. Hydrographic Notice, April 14, 1880.

† Middle island bearing about E.N.E. distant one mile from the south-east extreme of Bush island, and Small island bearing S.E. by E. distant 3 miles from the same point.

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like two islands, the westernmost being the smaller. It is seldom seen when entering the river from the southward. Fair anchorage may be obtained, protected from N.E. winds, to the southward of the lighthouse, at a quarter of a mile distant from the shore, in from 6 to 7 fathoms, muddy bottom, but there is always a heavy swell.

Tides.—At Shaweishan island it is high water, full and change, at 11h. 22m. Springs rise 14 feet, neaps 9¾ feet; neaps range 5¼ feet.

LIGHT.—A *fixed* white light, visible in all directions, is exhibited from the summit of Shaweishan island at an elevation of 229 feet above high water, and in clear weather can be seen from a distance of 22 miles. The lighthouse is round, painted black, and 55 feet in height; the light keeper's dwellings are printed white.

Fog signals.—In thick or foggy weather, when a vessel is known to be in the vicinity, *three* guns will be fired from Shaweishan island, with intervals of *five* minutes between the first and second, and *one* minute between the second and third; to be repeated if necessary after a further interval of *fifteen* minutes.

Bar.—The bar of Shaweishan channel, consisting of mud and sand, has 15 to 17 feet over it at low-water springs, with occasional deeper soundings. It may be crossed either to the westward or southward of Shaweishan island, on the latter course 16 or even 17 feet water may be obtained. The bar is 3 miles in breadth, extending north and south.

Shaweishan shoals.—The eastern limits of these shoals bear respectively W. by S distant 5 miles, and W. ¼ N. distant 5 miles from Shaweishan lighthouse, they have 10 to 12 feet over them at low water springs, and are from 2 to 2½ miles in length within the depth of 2 fathoms, trending east and west, with a small patch of 12 feet lying half a mile eastward of the southernmost shoal. They appear to have originally formed the tail of Drinkwater bank, from which they are now detached. If the directions for entering and leaving the river are strictly followed, and the set of the tidal streams attended to, these shoals will not be approached within one mile.

Fairway buoy.*—An iron buoy, painted red and black in horizontal stripes, 10 feet in diameter, and surmounted by a staff, with a black spherical cage 18 feet above the sea, has been placed in 4½ fathoms water, with Shaweishan lighthouse bearing N. 83° E. distant about 11¼ miles.

At 2 miles S.S.W. from the Fairway buoy, and 13 miles W. by S. from Shaweishan lighthouse, there is a portion of the Tung-sha banks which uncovers for a space of about 2 miles.

* Termed in the Chinese customs official light list "Drinkwater Point Buoy."

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Drinkwater point* on the north side of Shaweishan channel, is low and covered with grass and reeds, it is protected from the tide by embankments, and there are numerous trees at about one mile inland. The south side of Drinkwater point, as far as tide creek, is fringed by a mud flat which dries at low water springs, extending in some places 7 cables seaward, and steep-to.

Drinkwater bank.—This extensive bank extends eastward from Drinkwater point for 15 miles (within a depth of 2 fathoms), its eastern spit bearing from Shaweishan lighthouse, W. by N. ½ N. distant 6 miles. Near the western extreme, lying 2½ miles from Drinkwater point, the bank dries for 3 miles at low-water springs.

Trees.—This is a conspicuous clump of high dark trees, situated nearly 6 miles W.N.W. from Tide creek.

Grass island, on the south side of Shaweishan channel, is about a mile in length and of oval form; it is little more than a swamp, though its boundaries are clearly defined at half-tide; it bears from Block House island E.S.E. distant 2½ miles. At 2½ miles, N. by E. from Grass island is a small sand patch, which dries 2 feet.

Block House island, one mile in length by half a mile in breadth, is surrounded by an embankment; it is thickly wooded and populated, and is the first land sighted on the south bank by vessels entering the Yang-tse-kiang through Shaweishan channel.

From the south-east extreme of Block House island, Kiu Toan beacon bears S. 17° E. distant $7\frac{1}{10}$ miles; Kiu Toan small beacon S. 36° W. 3¾ miles; and House island beacon S. 53° E. 10¾ miles. Good anchorage may be had on the south side of Block House island, at about one mile from the shore.†

Small island.—This island is of an oval shape and bears N.W. by W. distant 4¾ miles from Block House island; it is about a mile in length by 4 cables in breadth, and is surrounded by an embankment. Inhabited and cultivated.

Duck swamp bears E.N.E. distant one mile from Small island. It is an island in process of formation, covered with reeds, which always show above water.

North and south of Duck swamp, are two blind channels. The northern of these can be entered from Shaweishan channel in deep water;

* The beacon on Drinkwater point, and that on House island, were erected by the Chinese Imperial Customs for the *Magpie's* survey, 1879–80; they have been recommended to be, and probably will be, retained.

† A beacon was erected on the south-east extreme of Block House island for the *Magpie's* survey, 1879–80, by the Chinese Imperial Customs, but it is doubtful if it will be retained.

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the southern, can only be approached by passing over one of the bars of the Light Draught channel. There is good anchorage in 4 fathoms, mud and sand, in both of these blind channels, and with 2½ cables swinging room, not less than 17 feet water will be obtained.

Tides.—It is high water, full and change, at Duck swamp at 0h. 18m.; springs rise 12½ feet, neaps 8½ feet. Neaps range 5½ feet.

Middle island.—This island bears about E.N.E. distant one mile from Bush island south-east extreme, and lies one mile north from Small island. It is about 2½ miles in length by half a mile in breadth, and is cultivated and well wooded, being intersected by creeks, and surrounded by an embankment.

At the eastern extreme of Middle island is a conspicuous clump of trees, which forms a valuable leading mark.

A small sand bank, which dries one foot at low-water springs, lies N.E. by E. distant 1½ miles from the conspicuous clump on Middle island.

Bush island.—This island (4 miles long by 1½ miles in breadth) is highly cultivated and well wooded, being partially embanked and intersected by numerous creeks; it lies in a general N.W. and S.E. direction, and forms the turning point for vessels making Wusung river by way of Shaweishan channel. Bush island south-east extreme bears N. 29° E., distant 4 miles from Wusung lighthouse, and W.S.W. one mile from the north-west extreme of Middle island; its north-west extreme bearing N. 12° W. distant 6 miles from Wusung lighthouse.

The island (which is being washed away at both extremes) is fringed on its south-west side by a bank of mud and sand, extending half a mile from the shore and steep-to.

There is a boat passage round the southern extreme of Bush island into Shaweishan channel, carrying 12 feet at high-water springs. If using this steer with Paou Shan pagoda astern in line with Round tree, bearing S.S.W. ¾ W. (passing north of Middle bank), until close to the island, after which keep at about half a cable distant from it.*

Bank.—At 1½ miles north from the north-west extreme of Bush island is situated a bank with as little as 7 feet water over it. This bank is probably the south-east spit of Tsung-ming flats.

Bush island buoy.—A buoy, painted *red* and *black* in vertical stripes, 6 feet in diameter, and surmounted by a black spherical cage, lies W. by S. ½ S. distant 5½ cables from the north-west extreme of Bush island

* In 1880; it is probable that the banks may have undergone changes in this locality since that date, too much reliance should not, therefore, be placed on these directions.—R. H. N., 1884.

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in 5 fathoms water; from it Wusung lighthouse bears S. 18° E., distant $5\frac{8}{10}$ miles.

DIRECTIONS.—After making Shaweishan island, the bar may be crossed, by passing either north or south of that island. If the former course be selected, round the island at a convenient distance, and when the light-house bears East, distant half a mile, steer S.W. $\frac{1}{4}$ W. for 5 miles; the least water being 15 feet at low-water springs. The course should then be altered to W. by N. $\frac{3}{4}$ N. for the Fairway buoy, about $8\frac{1}{2}$ miles distant.

By keeping 3 miles south of Shaweishan island, and from that position steering West for 4 miles, and then for the Fairway buoy on a W. by N. $\frac{3}{4}$ N. course, one foot more water may be obtained.

From the Fairway buoy, steer W. by N. towards Drinkwater point, and when south of the beacon on that point, steer W.N.W. until the conspicuous clump of trees on the eastern extreme of Middle island bears S.W. $\frac{3}{4}$ W. when alter course again to W. $\frac{1}{2}$ N. northerly, rounding Bush island at about 6 cables distant, to avoid the tail of Tsung-ming flats. From a position 7 cables south-west of Bush island buoy, a S.E. course will lead in mid-channel to the outer Wusung bar.

TIDES.—Shaweishan channel.—Great caution is required in steering courses between Drinkwater point and Shaweishan island, as the tides are rotary, and strong. During the first hour of flood, the stream sets so the southward, turning through west to north. The ebb, during the first hour, sets to the northward, from thence turning through east towards south. The streams at the fourth hour of ebb and the third of flood are generally the strongest, and ordinarily run from 3 to 4 knots an hour at springs, occasionally attaining a velocity of $5\frac{1}{2}$ knots an hour. The influence of these rotary tides is not felt to the westward of Drinkwater point in Shaweishan channel, and House island in South channel.

AMHERST ROCKS.—The highest of these rocks is 26 feet above high water, and lies S. 24° E. 17 miles from Shaweishan island; N. 37° W. $23\frac{1}{4}$ miles from North Saddle lighthouse, and N. 29° E. $23\frac{3}{4}$ miles from Gutzlaff island. They are a cluster of dark rocks, of which the largest is very prominent, and when first seen always makes as a single black rock; care should be taken to avoid the numerous fishing boats generally cruising in the vicinity. A detached rock, that dries 3 feet low-water springs, lies S. 9° E. 350 yards from the summit of the largest of this cluster.

Ariadne rocks.—This cluster of rocks, the shoalest of which is awash at low-water springs, are of the same formation as the Amherst rocks, from which they bear W. by S. distant 7 miles. There are 4 to $4\frac{3}{4}$

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fathoms water with muddy bottom close around, and with a strong ebb tide, the position of this danger can easily be distinguished by the appearance of discoloured water. Amherst rocks are well in sight from Ariadne rocks on a fine day, but if they are not seen, these rocks form a great danger in entering the Yang-tse-kiang, particularly during the northern and western streams, for the lead is no guide.

From Ariadne rocks, Shaweishan island bears North, distant 17 miles.

Buoy.—An automatic buoy (self-acting whistle) painted red and black, chequered, 8 feet in diameter at the water line, and 8 feet high, is moored in 5½ fathoms, and bears South distant 100 yards from the rock which is awash at low water.

Tides.—The tidal streams off Ariadne rocks, as in the Shaweishan channel are rotary. The flood, commencing at south and working northwards through west, attains its greatest strength (3½ knots an hour) between the third and fourth hours. The ebb, working from north southwards through east, runs between the third and fourth hours as much as 4 knots an hour, exceptionally to 5 knots.

GUTZLAFF ISLAND forms the southern conspicuous object at the entrance of the Yang-tse-kiang. If kept on a South bearing it will lead to the outer part of the bar at the entrance of South channel in not less than 19 feet at low-water springs, and on a S. by W. bearing in not less than 21 feet. (For *light* see page 396.)

YANG-TSE CAPE, forming the south point of entrance to the estuary of the Yang-tse-kiang, is situated 16½ miles W. by N. ½ N. from Gutzlaff island. The coast here is very low and quite level, having been entirely gained from the sea, the mud dries out half a mile at low water from the embankment. There is anchorage in 4½ fathoms southward of the cape, and fair shelter from northerly winds, unless they draw well to the eastward.*

South bank.—The coast for 20 miles northward of cape Yang-tse is fronted by an extensive mud bank which commences at the cape, its eastern edge or elbow, in 2 fathoms, is situated about 13 miles from the shore, and 12 miles N. by W. ¾ W. from Gutzlaff island. From this elbow the edge of the bank trends north-west and gradually approaches the shore to Kiu Toan beacon. It is of very soft mud, and on its outer part there are generally large floating fishing stakes in long rows, attached to nets.

* There was formerly a beacon on cape Yang-tse, but it has long since disappeared, and there is now no distinguishing mark whatever. H.M. surveying vessel *Swallow*, 1864, anchored off the cape for the purpose of ascertaining the position of the beacon, but the natives could give no information as to its existence.

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SOUTH CHANNEL, which is the recognised fairway into the river, is bounded to the southward by South bank, just described, and to the northward by the south-western edge of Tung-sha banks, and the shallows extending therefrom in the direction of Ariadne and Amherst rocks.

From the Outer bar to the clump of trees 17 miles north of cape Yang-tse, little alteration beyond a slight scour is apparent since the last survey in 1864, but from thence to the entrance of Wusung river, considerable change and marked improvement has taken place, Beacon spit has been merged into the south-east tail of Block House shoal, that shoal having altered in form, shifted 3 miles bodily to the south-eastward and one mile to the north-eastward, thus leaving a clear and deep channel of nearly 2 miles in breadth abreast House island, where it was formerly but from a half to three quarters of a mile wide.

A blind channel has also formed west of House island, a lane of deep water running to the N.W. between Block House shoal and House island, where good anchorage may be obtained in a depth of from 4 to 6 fathoms, mud.

Tung-sha banks.—These banks, forming the north-east side of South channel, have undergone considerable alteration since the survey of 1864. They do not appear to have extended to the eastward, but a general twist or shift to the southward and south-westward is observable, corresponding with the rotation of the tides in that locality. The S.E. spit, which breaks heavily in N.E. gales and which borders the entrance and outer bar, extends (within a depth of 3 fathoms) about 6 miles E.S.E. of Tung-sha light-vessel, with varying depths of from 8 to 16 feet. It may be cleared, when entering, by not bringing Tung-sha light-vessel to bear westward of N.W. by W. $\frac{3}{4}$ W. The south-west edge of the bank is steep-to, and forms a complete breakwater to the South channel, which affords secure anchorage everywhere in ordinary weather.

False channel.—This channel, about 6 miles north of the entrance to South channel, and lying between S.E. spit and the east portion of Tung-sha banks, is 5 miles broad at its entrance, and carries from 19 to 22 feet water for 6 or 7 miles in a N.W. direction until blocked by the bank; this false channel has been the cause of some disaster to vessels which occasionally have mistaken it for the outer bar. No difference is discernible in the nature of the bottom in either channel, nor can any reliable directions be given to indicate position in thick weather. Vessels under such circumstances should anchor, or, in boisterous weather, stand to sea.

Outer bar.—This bar, about 2 miles in breadth and 10 miles in length, has not less than 20 feet at low-water springs on its shallowest part. But little alteration has occurred since the last examination in 1864, except that a slight general scour has taken place, and the bank of 16 feet water,

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that formerly extended eastward of Tung-sha light-vessel, has shifted 4 miles S.W. of its former position.

LIGHTS AND BEACONS.—The south channel is marked by the following lights and beacons:—

Tung-sha light-vessel, painted *red*, with the word *Tungsha* on her sides, is moored in 3¼ fathoms in the entrance of South channel, at the central part of the bar, under the S.E. spit of Tung-sha banks. The light-vessel has one mast, surmounted by a black ball, and exhibits a *revolving* light (making one revolution every half minute), elevated 40 feet above the sea, which in clear weather can be seen 11 miles. From the light-vessel Shaweishan island bears N. 37° E. distant 21 miles, Kiu Toan light-vessel N. 52° W. 15 miles, and Amherst rocks N. 86° E. 19½ miles.

A gun will be fired when vessels are observed running into danger, and the course to be steered signalled by the Commercial Code. In foggy weather a steam fog-horn will be sounded at intervals of *ten seconds*. When necessary to lower the lantern for trimming, a small *white* light will be hoisted and a flash light burned. A *white* riding light is hoisted on the forestay.*

Kiu Toan beacon is painted black, and is erected on the southern shore of the South channel, bearing N.W. by W. ½ W. distant 16 miles from Tung-sha light-vessel. It is 70 feet above the sea, and can be seen in clear weather from a distance of 14 miles.

Kiu Toan Small beacon and Light.†—This beacon is a wooden tripod, 40 feet in height, and situated 5⅓ miles N.W. ¼ W. from Kiu Toan beacon. It carries a *fixed* light elevated 32 feet above the sea, showing *red* across the channel towards Block House shoal, and in all directions riverward. This light can be seen in clear weather, 5 miles.

Kiu Toan light-vessel.—A light is exhibited from a light-vessel moored in about 4 fathoms $2\frac{1}{10}$ miles (approximately) eastward of Kiu Toan beacon. It marks the north-eastern side of the seaward entrance to the channel between New shoal (page 424) and the south bank of the river.

The light is *fixed* and white and is elevated 35 feet above the sea, it should be visible in clear weather from a distance of 11 miles.

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* If the light-vessel be driven from her moorings, a fixed *red* light will be shown at each end of the vessel, in place of the usual *white* light. The ball will be struck, and until struck, will be surmounted by a *red* flag.

† For the survey of the entrance of the Yang-tse-kiang in 1879, a base of 12,050 feet (direction N. 56° W. and S. 56° E. *magnetic*) was measured along the shore, near Kiu Toan small beacon. From the beacon the south-east extreme of the base bore S. 61° E. (*Mag*.) distant 1·64 miles.

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A white *riding light is* exhibited from the forestay, 6 feet above the rail. When necessary to lower the light for trimming a small white light will be hoisted, and a flash light burned.

The light-vessel, (painted red, with the words *Kiu Toan* in white letters on her sides), has one mast, with an 8-feet black ball at mast head.*

Fog signal.—During thick and foggy weather, a 10-cwt. bell on board the light-vessel will be struck *three double* blows *every minute;* the interval between the blows in each pair will be *five seconds*, and between two successive pair of blows *fifteen seconds.*

Directions.—In order to avoid the S.E. part of Block House shoal, vessels should not bring Kiu Toan light-vessel westward of the bearing N.W. by W. ½ W. when within the distance of 4 miles seaward of her.

To clear New Shoal (page 424).—Kiu Toan beacon kept on a W. by N. bearing, just clears the S.E. tail of this shoal ground, *southward.* To clear the shoal *eastward* Kintoan light-vessel must not be approached within ½ a mile.

House island, on the north side of the channel, is a low, oval-shaped alluvial island, 4½ miles long by 2½ miles broad, intersected by numerous creeks, and in process of reclamation. From the beacon on the western side of the island, Kiu Toan beacon bears S. 87° W. distant 6½ miles; the south-east extreme of Block House island N. 53° W. distant 10¾ miles, and Tung-sha light-vessel S. 41° E. 11¼ miles. A mud bank extends 2¼ miles southward of the island, and half a mile from its south-west side. Good anchorage, in from 4 to 6 fathoms, with half a mile swinging room, well sheltered and with smooth water, may be found off the south-west side of House island.†

Block House shoal, the north-west extreme of which bears S.E. by S. distant 1¾ miles from the south-east extreme of Block House island, trends S.E. for 6½ miles, its south-east extreme bearing N. 80° E. distant 3½ miles from Kiu Toan beacon; to this extent it dries, but the tail further entends in the same direction for 2½ miles, at which distance there is 18 feet at low-water springs.

Buoy.‡—An iron buoy painted *red*, with staff and a black spherical cage 12 feet above the sea, has been moored in 34 feet water, off the central part of the south-west edge of the shoal. From the buoy, Kiu Toan

* If the light-vessel be driven from her moorings, a fixed *red* light will be shown at each end of the vessel, in place of the usual *white* light. The ball will be struck, and until struck, will be surmounted by a *red* flag.

† The 2¾ fathom patch formerly lying in mid-channel S.S.W. from the beacon on House island is stated no longer to exist.—*Berlin Notice to Mariners, 6th October 1883.*

‡ In consequence of the formation of New Shoal (page 424) Block House Shoal Buoy has been moved about 6 cables W.S.W. from the position given, and now marks its S.W. edge. Chinese Notice, 1884.

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beacon bears S. ½ W. (southerly) distant 2$\frac{9}{10}$ miles, and Kiu Toan small beacon W. by N. distant 4½ miles. (*See* foot note, p. 423.)

New Shoal.—A strip of shoal ground lying parallel with the course of the river and about 3 cables in breadth, has recently formed about 5 cables westward of Block House shoal.

The outer extreme of this strip lies with Kiu Toan beacon bearing W. ½ N., distant 2$\frac{2}{10}$ths miles; the shoal ground extends thence in a N.W. ½ N. direction for about 5½ miles, or to a position with Kiu Toan small beacon bearing W. by S., distant 3 miles. The depths on this shoal ground (sand) are 2½ to 3 fathoms at low water ordinary spring tides.

In the outer portion of the channel between this shoal ground and Block House shoal, the depths are 4 to 5 fathoms, but abreast the red buoy of Block House shoal the soundings decrease to 3¼ fathoms, and at one mile above the buoy to 2¾ fathoms.

South channel, westward of this newly formed shoal ground, is thus reduced in breadth, to about 8 cables, and has depths of 4 to 5 fathoms, over mud and sand.*

West spit.—The tail of this bank, which extends north-westward from Block House island, bears W. by N. ¾ N. distant nearly 3 miles from the west extreme of that island. It is entirely out of the track of vessels unless using the Light Draught channel.

LIGHT DRAUGHT CHANNEL.—This opening, between Small island and Duck swamp to the northward, and the shoals off Block House island to the southward, afforded in 1880 a passage 5½ miles long, with 7 feet least water at low-water springs,† it leading almost direct from Wusung bar to the Shaweishan channel, and practicable for vessels of small draught with a rising tide. It is not recommended until properly buoyed, but by careful attention to the tide and lead, it could be crossed at half flood by steam vessels drawing 12 feet water.

Directions.—After rounding Lismore light-vessel, at a cable distant, steer E. ¼ S. until the east extreme of Small island bears N. 39° E., when the Chinese lookout will be seen just open north of the south cavalier of fort A.‡ From this point steer E. by N. ½ N. until the east extreme of trees on Block House island bear S.E., when the helm should be ported,

* Information from Lieut. Hoskyn, R.N., Commanding H.M. surveying vessel *Flying Fish*, 1884.

† A depth of 9 feet at low-water springs should be obtained when this channel is properly buoyed. H.M.S. *Nassau* drawing 13 feet used this channel.

‡ It will appear in line with the third embrasure from the south extreme of the fort. The Chinese lookout bears from Wusung lighthouse N. 24° W. distant ⅛th of a mile.

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and course altered to E. ½ N. (to clear the spit extending E. by S. about 2 miles from Duck swamp). By following the above directions no shoaler cast than 13 feet should be obtained at half flood. When the trees on Block House island bear S. ¾ E. the vessel is clear of all dangers.

If entering the Light Draught channel from Shaweishan channel, bring Drinkwater beacon to bear E. by N., and run to the westward, keeping this bearing on astern until the east extreme of Block House island bears South,* when a W. by S. ½ S. course will lead through the channel in 13 feet at half-flood, and 7 feet at low-water springs. As soon as the south-eastern extreme of Small island bears N.E., deep water is reached.

Middle bank.—This bank, composed of mud and sand, dries at low-water springs; it is 3¼ miles in length, and lies north-east of the entrance to Wusung river, on the north bank of the South channel. Its north-west and south-east extremes bear respectively N. by E. and E.N.E. (nearly), distant 3 and 3¼ miles from Wusung lighthouse; the south-west edge of this bank is steep-to.

Coast.—The coast on the south side of South channel from the entrance to Wusung river is low and level, well wooded and cultivated, and partially embanked. The 3-fathoms line is found at about 4 miles off shore, in an E.N.E. direction from the clump of trees lying 6½ miles southward of Kiu Toan beacon; westward of this it approaches the coast, and between Kiu Toan beacon and the entrance to Wusung river lies about three-quarters to half a mile from the shore; the south side of the channel is steep-to, and it is highly imprudent, after passing Kiu Toan beacon, to allow the water to shoal to less than 5 fathoms.

Clump trees, lying S. by E. ½ E. about 6 miles from Kiu Toan beacon, consist of a dark cluster of trees, which (though not at first easily discernible), are the most remarkable on this part of the coast.

Gun tree lies N.N.W. about 4½ miles from Clump trees.

High Double:—and Scraggy trees.—At about 2¼ miles N.W. ¾ W. from Kiu Toan small beacon are two remarkable trees, known as High Double; they become visible after passing Block House shoal buoy; at one mile N.W. of these are a clump of three, known as Scraggy trees.

Triplets trees.—This remarkable group of three trees† (which with High Double and Scraggy are the most conspicuous on this part of the river) are important to vessels using the Light Draught channel.

From them Kiu Toan small beacon bears S.E. by E. distant 5 miles; the

* At this position the south extremes of Middle and Bush islands in line, but the latter can only be seen in fine weather.

† There is a fourth small tree attached to this group, but it is very indistinct from most points of view.

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south-east extreme of Block House island bears East 6½ miles; and the south-east extreme of Small island bears N. 24° E. distant 3½ miles.

OUTER ANCHORAGE.—In fine weather a vessel may anchor anywhere between Gutzlaff island, Amherst rocks, and the Saddle islands, but should always have one of these objects in sight, so as to take a good departure. It is recommended that an anchorage should not be taken at night under the Saddle islands, during the N.E. monsoon, unless there are appearances of bad weather, as it will frequently take all the daylight of the next day to work up to the entrance of the Yang-tse-kiang. In the summer season, if bad weather is approaching, (which the barometer does not always foretell) a stranger should not attempt to run in, unless certain of getting within the bar, or making Tung-sha light-vessel; but either an anchorage should be sought under Saddle islands, or the vessel kept at sea, standing off and on as it is dangerous to enter the river when a gale is coming on. It is preferable to anchor rather than to stand out to sea, as the weather is sometimes thick and foggy, the tidal streams strong, and the position not easily ascertainable under such circumstances.

The anchorage under Saddle islands is described at page 392; the best anchorage at the Parker group is northward of Senhouse, the south-eastern island, in 10 fathoms; or between Senhouse and Raffles islands in 6 or 7 fathoms water, all the approaches being apparently clear of danger.

TIDES.—It is high water, full and change, in the vicinity and eastward of Gutzlaff island, at 11h. 30m.; springs rise about 15 feet. The highest tide occurs on the second day after full and change. At Tung-sha light-vessel it is high water at 11h. 36m.; springs rise 14 feet, neaps 10½ feet, and neaps range 7 feet. At the entrance of Wusung river it is high water at 0h. 40m., springs rise 12 to 15 feet, neaps 8 to 10 feet. At Shanghai it is high water at 1h. 30m., springs rise 10 feet, neaps 7 feet, and neaps ranges 4 feet.

The tidal streams at the entrances of the Yang-tse-kiang from Gutzlaff island to Shaweishan rotate, performing one revolution (with the sun) in 12 hours. To the southward of Gutzlaff island the tides are also rotary, but do not change in direction with that regularity which is observed about the Amherst rocks. There is also reason to believe, although the fact has not yet been conclusively established, that they preserve the same character for some distance to seaward, and far to the northward.* During

* Mr. Swain, Master of H.M.S. *Pilot*, 1850, states that the revolving tide has been noticed as far out as the Saddle islands, whilst others assert that the stream when fully made there sets N.W. by W. and S.E. by E. These statements are not contradictory. Lieut. Bullock, R.N., found the tides to rotate, when 120 miles north of the entrance to the Yang-tse-kiang, at 70 miles from the land.

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its revolution the direction of the stream changes near the Ariadne rocks about two points every hour, excepting when veering from N.W. to N.E. soon after high water, and from S.E. to S.W. soon after low water, when the change is more rapid. The western stream for the most part makes and completes the flood; and the eastern stream for the most part makes and completes the ebb, though the first part of the flood is made by the southern stream, and the first part of the ebb by the northern, termed sometimes "tide and half-tide."

At 6 miles above Tung-sha light-vessel, where the stream is confined within the banks of South channel, the flood sets N.W. by W., and the ebb S.E. At Tung-sha light-vessel the movement is rotary, although somewhat influenced by the direct stream of the river.

The set on the South bank, which occurs on the last hour of ebb and first hour of flood, and which was described by earlier navigators as one of the chief dangers to be guarded against when entering the Yang-tse-kiang, still exists.

In the river the streams are quick in turning, the flood making at 1h. 30m. after low water, and the ebb from 2 hours to 2h. 30m. after high water.* There is very little slack water, the ebb running 7 hours, at springs, and traversing during that period a distance of 24 miles; the period of greatest velocity (5 knots an hour) being the fifth hour after high water. The flood runs 5 hours, and with much less strength, seldom exceeding a velocity of of 4 knots, the distance attained during the whole tide being 16 miles. On the change day the ebb was observed to run 20 miles, and the flood 10 miles on the whole tide. This was well within the banks, and therefore in the direct influence of the river stream. In strong northerly winds the southerly set at the first of the flood is frequently felt as far within the entrance as the Tung-sha bank is covered.

At Tung-sha light-vessel the velocity of the stream seldom exceeds 4½ knots an hour at springs, or 2½ knots at neaps; and the duration of the maximum strength never exceeds 2 hours. In the early part of the year the velocity has been recorded as low as 3½ knots an hour at springs, and one knot at neaps, and on one or two occasions as slack during a great part of both tides. The ebb is accelerated by freshes, and runs strongly during the period of the summer inundation. N.E. gales and other strong winds may increase or retard the velocity of the stream or its time of

* The tide register kept at the Tung-sha light-vessel in January 1857, shows this change to take place at from 30m. to 1h. 30m. after high and low water, on both tides alike. It may, therefore, be inferred that when the river is inundated the ebb has greater duration after low water than in the winter and spring months; nevertheless it is still doubtful whether this influence is felt much below the light-vessel.—Mr. George Stanley, Master, R.N., H.M. surveying vessel *Swallow*, 1864.

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making, but it is doubtful whether they sensibly alter its direction, for it is more probable that the surface water only is affected.

The velocity of the rotary stream rarely exceeds 4 knots an hour at springs, and 2½ knots at neaps, the continuance of the maximum rate being for one hour, or two at most, and abating to about one knot at change of tide ; its direction is shown in the following table.

To the southward of Gutzlaff island, where there is little rotation, the body of the tide sets W.N.W. and E.S.E., attaining a maximum velocity of 5 knots an hour. Extending seaward, the tides become more rotary, with diminished force, but towards Hang-chu bay, they become more direct, and their velocity gradually accelerated, by the immense indraught into that bay.

TIDAL STREAMS. From the observations of H.M.S. *Magpie*, 1879–80.

Time of Tide.	Shaweishan island.		Ariadne rocks.		Tung-sha light-vessel at Springs.		Tung-sha light-vessel at Neaps.	
	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.
At H. W. -	North	0·5	N. by W.	1·0	N. by W.	1·0	N.W.	0·6
1st hr. ebb	E.N.E.	1·0	N. by E.	1·0	N. by E.	1·5	N. by W.	0·6
2nd „ „	East	2·0	N.E. by N.	1·5	E.N.E.	2·0	E.N.E.	0·6
3rd „ „	East	2·5	N.E.	3 to 4	S.E.	3·0	E.N.E.	0·8
4th „ „	S.E. by E.	2·5 to 4	E.N.E.	3·0	S.E. by E.	3·5 to 4	S.E.	2·1
5th „ „	S.S.E.	2·5	E.S.E.	3·0	S.E. by E.	4·0	S.E.	2·3
6th „ „	South	0·5	S.E.	2·0	S.S.E.	2·0	S.E.	1·8
At L. W. -	S. by W.	0·5	S.S.E.	1·0	South	0·5	S.E. by S.	1·1
1st hr. flood	S.W.	0·8	S. by W.	2·5	S. by W.	0·7	South	0·6
2nd „ „	W.S.W.	2·0	S.S.W.	3·2	W.S.W.	2·5	W. by N.	1·6
3rd „ „	W. by S.	2·5	S.W.	3·5	W. by N.	2·5	W. by N.	1·8
4th „ „	W. by S.	3·0	W. by N.	3·5	W.N.W.	3 to 4	W.N.W.	1·7
5th „ „	N. W.	1·5	N.W.	2·5	N.W.	2·0	W.N.W.	1·5
6th „ „	N. by W.	0·8	N.W. by N.	1·5	N.N.W.	1·0	N.W. by W.	0·7

Velocity given in knots per hour.

The foregoing table will afford the best guide to a knowledge of these rotary tides, and will be found valuable should it be deemed desirable or necessary to stand in and make Tung-sha light-vessel in thick weather. If a good departure be obtained before the outer islands or lights are lost sight of, the entrance may be confidently steered for, provided the course and distance run be kept corrected each hour, or oftener, by making allowance according to the table. Perfect reliance may be placed upon the direction of the stream, as given therein, which will seldom be a point in error, but the velocity is a matter of judgment, and can only be correctly approximated by a careful consideration of all the attendant circumstances.

PILOTS.—There are in the Yangtze-Kiang 8 one masted pilot cutters, carrying on their sails the number of the boat, and which alto-

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gether have 35 pilots on board. These pilot-boats have no fixed station, but they frequently cruise off the islands of the Saddle group, and are pretty certain to be found (unless the weather be too rough between Gutzlaff island and the Amherst rocks; but rarely northward of the latter, and never off Shaweishan island.* These licensed pilots are under the control of the harbour master of Shanghai. No sailing directions can take the place of their usefulness to the stranger under circumstances where the safety of the vessel depends so much upon a correct knowledge of the tides.

The charges established under a code of regulations, by agreement between the Chinese government and the foreign ministers, were revised in 1871 as follows:—†

Distance.	Sailing Vessels per foot.	Steam Vessels or Vessels in tow per foot.
	Taels.	Taels.
From Gutzlaff island (bearing S.S.W.) to Shanghai -	5·00	4·00
„ Tung-sha light-vessel to Shanghai - - -	4·50	4·00
„ Wusung to Shanghai - - - -	2·00	1·50
„ Gutzlaff island (bearing S.S.W.) to Wusung -	3·50	3·00
„ Tung-sha light-vessel to Wusung - - -	3·00	3·00

GENERAL DIRECTIONS.—From the southward.—If bound to the Yang-tse-kiang during the S.W. monsoon, endeavour to make the island of Video (about 32 miles south of Saddle islands), and having passed eastward of it at the distance of about two miles, steer about N. by W., making some allowance for tide, which (although in this locality little is known accurately respecting it) may be considered to set westward on the flood, and eastward on the ebb. This course will lead 3 miles eastward of Beehive rock (13 miles distant from Video island) and a further run of 18 miles on the same course, will bring a vessel to the passage between the Saddle and Parker groups, which is the most direct route into the Yang-tse-kiang. To avoid Cairnsmore rock (the only known sunken danger in the passage between the islands), hug the Bit rock, from which to Tung-sha light-vessel the course is N.W. ¾ W., leading close along the South bank, and across the centre of the bar.

If preferring for any reason to pass outside the Saddle islands, a N. by E. course should be steered from Video island, the only danger to be avoided

* Berlin notice to Mariners, No. 44 of 1883.

When the pilots are all distributed on board vessels their cutters anchor near the Tungsha light-vessel.

† It is not certain that this tariff has remained unchanged to the present date (1884).

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being Childers rock, situated 4½ miles south of the south-eastern extremity of East Saddle island. The Saddle islands may be rounded as convenient, and after passing the North Saddle lighthouse, it may be brought astern bearing S.E. by E. ½ E. easterly, the opposite course to which will lead across the fairway of the bar to Tung-sha light-vessel.

During the N.E. monsoon, if not intending to call at Ning-po, vessels should pass eastward of Chusan and enter the archipelago to the northward of that island. It is best, however, to endeavour to make the Saddle islands, as being the most weatherly landfall, but if unable to fetch so far to the northward, and the parallel of 30° N. has been reached, the high dome-shaped island of Video, 996 feet high, will then be a conspicuous object, for it may be seen in clear weather from a distance of about 30 miles; it has a remarkable white cliff, which shows when the island bears N.W. by N., and in thick weather any soundings of less than 30 fathoms will indicate that the vessel is in the vicinity of this or the neighbouring islands, provided she be southward of the Great Yang-tse bank. The most remarkable land to the southward of Video is Chookea island, on which there is a round topped peak 1,164 feet high; eastward of Chookea are several islets, of which Tonting, the outer, is about 40 feet high, with detached reefs extending south-west of it.

If unable to turn to windward, anchorage will be found on the southern side of Ousha island, in the entrance to Sarah Galley channel. If unable to weather the north extreme of Chookea, the south side of Pootoo island will be found the best stopping place; the anchorage is in 12 fathoms, under a hill with three chimneys on it; the mud bank from the shore is very steep, shoaling quickly from 12 to 2 fathoms. From this position, in a handy vessel the best route will be through Lansew bay, and through the channel between Lansew and Tae-shan islands; but large vessels had better pass eastward of Video island, and enter the archipelago farther to the northward. If unable to fetch to windward of the Barren islands, and should the tide or weather be unfavourable for entering the river, a convenient anchorage can be found among the Saddle group.

It may be here noticed that as the entrance of the Yang-tse-kiang is somewhat difficult for a stranger to make even in fine weather, the difficulty is greatly increased if it be necessary to beat up against a contrary wind especially in bad weather; no vessel should therefore attempt to do so without a pilot, or unless it be sufficiently clear to ensure keeping the islands in sight until they dip. But with a leading wind, and a good departure either from Gutzlaff island or the Amherst rocks, together with strict attention to the course and distance made good, a vessel may stand in for Tung-sha light-vessel.

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From the northward or eastward.—Vessels bound into the Yang-tse-kiang from the gulf of Pe-chili are recommended to make Shaweishan island, not approaching the coast within the depth of 15 fathoms until within 60 miles of that island, when the water may be shoaled to 10 fathoms with safety, by which means there will be no difficulty in further making the Amherst rocks, in daylight. In N.E. winds, if blowing strongly, and attended by the thick weather which usually accompanies them, there is a great probability of overrunning the distance, owing to the strong southerly set (notwithstanding that the tides are revolving), and so getting to leeward, and having to work up from the Saddle islands. Although it is better to do this than incur any risk, it is suggested in such a case, that if the Amherst rocks be not made before dark, especially if Shaweishan island or its light be not seen, the vessel should be hove-to till dawn, sufficiently far to the northward to allow for drift and a set of a mile an hour, keeping a careful reckoning.*

In N.W. winds and fine weather, the Amherst rocks should always be made. In November and December, when these winds prevail, vessels from Japan should keep well to windward, for if the wind is of long continuance there is every probability of being driven to leeward of Video island: in such case, should the weather be thick, the Great Yang-tse bank will afford a good guide in approaching the entrance of the river, owing to the nature of the bottom, which is of clean river sand.

Whether intending to enter by the North or South channel, Shaweishan is the best landfall to make when bound from the northward or eastward. By keeping it on a N.N.W. bearing (astern) it will lead towards the Amherst rocks, which may be passed at half a mile on either side. These rocks bearing E.N.E. (astern) will lead south of Ariadne rocks, when a W. by S. course may be steered till Tung-sha light-vessel comes in sight, making allowance for the state of the tide. Should a vessel in thick weather find herself being set over to the Tung-sha bank, she should immediately steer South for the channel and anchor.

ENTERING the RIVER by SOUTH CHANNEL.—To a stranger the entrance of the Yang-tse-kiang in hazy weather is somewhat embarrassing, for after the outer islands are lost sight of, neither land nor marks are visible, but in clear weather the navigation is not difficult by day, and since the establishment of the three fine lights on the North

* H.M.S. *Dove*, thus hove-to, bore up at daylight to make the Amherst rocks, distant then by reckoning 30 miles; at daylight they were distant only 9 miles.

H.M.S. *Hornet* in March 1879 was set 23 miles to the south-westward in 14 hours when making Shaweishan island from the northward.—Lieut. J. W. Brown, H.M.S. *Hornet*, 1879.

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Saddle, Gutzlaff, and Shaweishan islands, it is equally easy, if not more so, at night.

Leaving the Saddle islands, keep North Saddle lighthouse astern bearing S.E. by E. ½ E. easterly* until Gutzlaff island bears South, distant 15 to 16 miles, recollecting that if Shaweishan shows plainer than Gutzlaff, the vessel is too far to the northward, and in danger of entering a false channel through the Tung-sha banks about 6 miles northward of the fairway, and may be dangerously near to the Ariadne rocks, in which case the Amherst rocks will also be visible. Gutzlaff island, when first seen, will appear like a small round lump, and its lantern, 270 feet high, which is mounted on a tripod painted white, may not be visible. Shaweishan island, 196 feet high, a little larger than Gutzlaff island, and surmounted by a lighthouse painted black, is not often seen when a vessel is in the right position for approaching the bar and fairway.

With Gutzlaff island on the above bearing and distance, if the day be clear, Tung-sha light-vessel will be visible from the mast head (it is rarely seen beyond 7 miles from the deck), when steer for her between the bearings of W.N.W. and N.W. to cross the bar, making due allowance for tide, the mid-channel course being N.W. by W. As long as North Saddle and Gutzlaff islands are in sight, the reckoning should be tested frequently by cross bearings, so as to verify the allowance made for tide, and thus give greater confidence in entering the river.

In working up from the Saddle islands, do not bring Gutzlaff island to bear eastward of South, until 15 miles northward of it, when it may be brought to bear S. by E. The vessel will then be on the edge of the South bank, and may stand to the westward, nearly into her own draught, bearing in mind the direction of the tidal streams.

The foregoing directions are for vessels of about 18 feet draught, and will lead over not less than 20 feet at low-water springs; small craft may close with the South bank when Gutzlaff island bears South, distant between 12 and 15 miles, and steer up with the lead for their guide, or having passed Gutzlaff island, if the weather be fine, a small vessel may safely steer in with that island astern, bearing S. by E.; this will lead over the eastern edge of the South bank in about 15 feet at low water, or about 30 feet at high-water springs.

Too much attention cannot be paid to the set of the tidal streams at the entrance of the Yang-tse-kiang, *see* page 428; and also to the lead. So long

* In January 1880 a wreck was reported as lying north-west of the Saddle islands with North Saddle lighthouse bearing S.E. by E. easterly, and the westernmost rock off the Side Saddle islands bearing S. by E.; some of the spars were then visible above water.—Shanghai Notice to Mariners, No. 110, dated 10th January, 1880.

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as the weather is clear Gutzlaff island forms an admirable mark, and it has only to be kept bearing westward of South until it is distant 15 miles, when a vessel may steer N.W. by W. for Tung-sha light-vessel; but in thick weather and a working breeze with a variable tide, it is difficult to ascertain when 15 miles have been made, and the vessel will be liable to be driven over to the Tung-sha banks, where several vessels have been wrecked. These banks should always be approached with caution, as their southern edges give no warning of approach; and, as the tide may be setting across and not into the river, it will be as well to ascertain the vessel's true rate over the ground by using the deep sea lead for a ground log* instead of the log-ship, and taking the opposite to the bearing of the line as the course made good.

Whenever the ground log is not used, it is recommended to allow hourly for the tides, as given on page 428, both as to direction and velocity. Experience has shown that Tung-sha light-vessel can be made by following this method, always being careful to verify the position by bearings of Gutzlaff and the Saddle islands as long as they remain in sight. The break on the head of Tung-sha banks will sometimes be seen after passing Ariadne rock,† but in thick weather the southern side of the channel is no doubt the more advisable side to border on. The lead should never be neglected. The bottom on the Tung-sha banks is composed of sand, with occasional patches of mud and sand, and also of mud. It is harder than that of the South bank, which is almost wholly composed of brown mud and is very soft.

It is remarked, that, although there may be little or no difference in the *appearance* of the bottom on the Tung-sha and South banks, there is a difference in the *feel*, that on the South bank being very soft, that on the Tung-sha banks hard.

Tung-sha light-vessel to Wusung river.—The Tung-sha light-vessel is moored at the central part of the outer bar under the S.E. spit of Tung-sha bank. Vessels should pass southward of her, from which position the mid-channel course is N.W. ¾ W. westerly; if beating up, after passing Tung-sha light-vessel tack in 3½ fathoms when standing towards the South bank. The deepest water is found near the southern edge of the North bank, but in standing towards it do not wait for the second shoal cast to go about. Generally the edge of the North bank is lined with heavy fishing stakes, planted in 4 and 5 fathoms, with only a few feet water close inside them.

* The lead used should be fully 60 lbs. weight, in consequence of the strength of the tides.

† Especially during strong N.E. winds.

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The beacon on House island and the Tung-sha light-vessel are good marks for fixing the position of a vessel by cross bearings, until Kiu Toan beacon is well in sight, which it will be when the hull of the Tung-sha light-vessel is just dipping. At night bring Tungsha light-vessel astern on a S.E. ¾ E. easterly bearing, and keep it so till the light dips; this will lead on the north side of the channel, but in the best water. Between Kiu Toan small beacon and Kiu Toan beacon the channel has become narrowed to 8 cables by the formation of the new shoal (described on page 424), here the south shore will be plainly in sight.* After passing Kiu Toan light-vessel steer N.W.; and when Kiu Toan small beacon bears South,—N.W. by W.; until the Triplets (trees) bear S. ½ W.; when the course should be altered to West, for the Lismore light-vessel.†

At night, when about 1½ miles above Kiu Toan beacon, the light of the small beacon will be in sight. Cross bearings should be frequently taken. Block House island will soon rise after passing Kiu Toan beacon, having at first the appearance of a cluster of fishing boats, and gradually showing as a low island covered with bushy trees.

The south shore, the bank of which is steep-to, should not be approached under 5 fathoms. Wusung lighthouse will be in sight, just over the point, after passing Block House shoal, but the *red* light it exhibits at night in the direction of South channel is not visible more than 5 miles.

LEAVING THE RIVER.—In passing out of the South channel, vessels of light draught, when 2 miles south-east of Tung-sha light-vessel, may steer for Shaweishan island direct, if bound northwards, without finding less than 9 feet water at low-water springs, but if a flood tide be running, great caution is required, to avoid being drawn on the Tung-sha banks.

WUSUNG RIVER AND SHANGHAI.

Wusung river,‡ on which is situated, at 12 miles from its entrance, the great commercial port of Shanghai, is about 60 miles in length, and is the lowest tributary of the Yang-tse-kiang. It flows from lake Tien-shan or Miau, through which there is water communication with the Grand Canal, and thence northward to the important city of Suchu (Suchao), and southward to Hang-Chu fu. The real name of this river is Wongpu or Hwangpu, but it has taken the commonly received name from the village of Wusung, situated about a mile within the entrance on its left bank, and on the north side of a creek leading to Suchu.

* The first sight of land will be the remarkable clump of trees on the south bank of the river 6½ miles below Kiu Toan beacon.

† The right bank of the river, between Kiu Toan beacon and the Lismore light-vessel is *very steep to.*

‡ *See* Admiralty plan:—Wusung river, with enlarged plan of entrance, No. 1,601; scale, $m = 3$ inches.

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A few centuries ago Wusung river barely existed, and much of the country north and east of Shanghai is the growth of the last 300 years. This process of accretion and change is still in active operation; from a mere creek in the past, the Wongpu has in process of time become a fine river, capable of admitting the largest trading vessel, and it is probable that the improvements which are likely to result from an active and enlightened conservancy, will become permanent in their character.

OUTER BAR.—The outer bar of Wusung river has narrowed since the last survey (in 1869) about 150 feet; it commences about a mile from the entrance to the river, and carries not less than 18½ feet at low-water springs, with occasional deeper soundings, over a narrow channel between the shallow and extensive mud flats which border both shores of the river.

Vessels should cross the outer bar with Wusung lighthouse bearing S.W. by W. ½ W. so as to avoid the dangers on either side. The channel subtends an angle of about 6° from the lighthouse, so that a course on a S.W. by W. ¼ W. bearing of it will hug the northern flats, and a course on a S.W. by W. ¾ W. bearing of it, the southern.

Buoy.—The north side of the bar channel is marked by Wusung buoy, on the edge of the shoal water off Marecageuse point; this is a large nun buoy, painted red and black in vertical stripes, 10 feet in diameter and 18 feet high to top of cage. It lies in 20 feet at low-water springs, with Paou Shan pagoda bearing N.W. by W. ¾ W. and Wusung lighthouse S.W. by W. distant respectively $1\frac{7}{10}$ miles and one mile.

Lismore Wreck buoy.—A green, iron, nun buoy (with the word *Wreck* painted on it in white letters), 4 feet in diameter, is placed W.S.W. of, and close to the wreck of the *Lismore*, in 13 feet water (low water springs). From it Paou Shan pagoda bears N. 61° W. distant $2\frac{1}{10}$ miles and Wusung lighthouse S. 76° W. distant 1¼ miles.

LIGHT.—A junk painted black, with one mast surmounted by a black ball, is moored in 17 feet water, at one cable N. 53° W. from the *Lismore* wreck buoy, with Paou Shan pagoda bearing N. 63° W. distant 2 miles and Wusung lighthouse S. 72° W. distant 1⅓ miles. From this light-vessel is exhibited 2 fixed lights vertical, the upper *red*, the lower *white*, visible in clear weather from a distance of one mile.

Fort A.—This fort (the south cavalier or angle of which bears N. 25° E. 1½ cables from Wusung lighthouse), is a rectangular mud structure, the guns of which completely command the entrance to the Wongpu; behind the fort are four barracks, each capable of containing 500 men.

Coast.—The western side of the mouth of Wusung river is embanked, and a canal runs parallel with the shore from Paou Shan city to Wusung.

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LIGHT.*—At 1½ cables southward of Fort A. is situated Wusung lighthouse, a square brick tower with a total height of 58 feet. From it is exhibited a *fixed* light, which shows *white* from the river bank north-west of the lighthouse to the bearing of S. 2° W.; *green* between the bearings S. 2° W. and S. 59° W.; *white* over the navigable channel of the entrance between S. 59° W. and S. 72° W., and *red* between S. 72° W. and the opposite bank of Wusung river. The light is elevated 50 feet above the sea, and in clear weather the *white* light should be seen from a distance of 12 miles; the *red* light, (which also shows over the Yang-tse-kiang to seaward,) about 8 miles; and the green light 5 miles. The illuminating apparatus is dioptric, and the light-tower is painted black. Close to the light-tower, and directly south of it, is the light-keeper's dwelling, a house with sloping roof surmounted by a square turret.

Coast.—A yellow joss house with poles, about a mile above Fort A. marks the village of Wusung, situated on the northern side of the creek leading to Suchu, and at about one mile further up the coast is situated the Chinese custom house, a conspicuous square white building surmounted by a turret and knob, in front of which is a mast or signal staff, from which is exhibited, by geometrical signals, the depth of water on the inner bar (*see* opposite page). Abreast and just above the custom house is the best anchorage for vessels intending to remain, in which case they should moor at least half a cable above the line of the fairway marks for crossing the inner bar.† In order to avoid the risk of collision, as the flood tide sweeps along this shore, requiring rather a sharp turn to be made to cross the bar, vessels only waiting for tide to cross the inner bar, should anchor in the offing outside the outer bar. At 3½ cables S.E. of the Chinese customs' station is the Chinese flagstaff and Naval Barracks.

East bank of river.—This shore at entrance is very low and bordered by mud flats, which (within a depth of 6 feet) extend to the northward 8 cables; several vessels have been wrecked on these shoals. Over these flats Wusung light shows red. The shore is reedy as far as Pheasant point, a sharp elbow, about a mile within the entrance; below Pheasant point the banks are extending.

INNER BAR, Beacons and Lights.—The inner bar is situated above Pheasant point, and appears to be formed by the eddy which that point causes on the flood. It presents no great obstacle to vessels drawing 10 feet water, for the channel with that depth at low-water springs is one cable broad; but for another foot of depth the channel is very narrow,

* The bearings of limits of sectors of coloured rays shown from Wusung lighthouse are subject to alterations, depending on changes in the channel and also in the position of the *Lismore* wreck light-vessel.

† A vessel intending to anchor at Wusung must hoist the telegraph flag at the fore, when the berthing master will come on board between Pheasant point and Wusung village.—Staff-Commander James, H.M.S. *Iron Duke*, 1879.

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a matter of importance to vessels of deep draught when crossing. The entrance to this channel is abreast of, or immediately above, the Custom house, and the leading mark for the deepest water (which in February 1881 was 10 feet 11 inches at low-water springs) is at present two beacons on the north bank of the river, about $1\frac{1}{4}$ miles above Pheasant point kept in line with each other bearing N. 88° E.* The front beacon is low with a triangular top; the back and eastern beacon a little removed from the bank, is a high beacon with a rectangular top. At night a low *red* light is exhibited on the river bank, with a high *white* light on the low beacon behind it, indicating the same line of direction. These lights are visible 2 miles in clear weather. *The bar channel shifts periodically and varies in depth.*

Any steam vessel of deep draught requiring to cross the bar at night, may, by making application to the officer in charge of the customs' station, arrange to have a light hoisted on the signal staff, to show when there is water enough to cross.

INNER BAR TIDAL SIGNALS.

The signals indicating a depth of water—from 10 to $24\frac{1}{2}$ feet—on the inner bar, will be seen in approaching the signal station at the Custom house, both on entering and leaving the river:—

Depth of Water in feet on Bar.	South Yard-arm.	North Yard-arm.	Depth of Water in feet on Bar.	South Yard-arm.	North Yard-arm.
10	▲	◆	$17\frac{1}{2}$	●	●
$10\frac{1}{2}$	▲	⧗	18	●	■
11	◆		$18\frac{1}{2}$	●	▲
$11\frac{1}{2}$	◆	●	19	●	◆
12	◆	■	$19\frac{1}{2}$	●	⧗
$12\frac{1}{2}$	◆	▲	20	⧗	
13	◆	◆	$20\frac{1}{2}$	⧗	●
$13\frac{1}{2}$	◆	⧗	21	⧗	■
14	■		$21\frac{1}{2}$	⧗	▲
$14\frac{1}{2}$	■	●	22	⧗	◆
15	■	■	$22\frac{1}{2}$	⧗	⧗
$15\frac{1}{2}$	■	▲	23	▲	
16	■	◆	$23\frac{1}{2}$	▲	●
$16\frac{1}{2}$	■	⧗	24	▲	■
17	●		$24\frac{1}{2}$	▲	▲

* The Inner bar beacons (which were formerly in line on an E. $\frac{3}{4}$ S. bearing,) were moved in May 1881 to correspond with the alteration in the channel, viz., N. 88° E. from the flag-staff in front of the houses occupied by the Great Northern Telegraph

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With the tide rising a ball will be shown from the mast-head.

Should there be more water on the bar than 24½ feet, or less than 10 feet: the number of feet will be shown from the mast-head by the Universal Code of Signals, and the half feet by a red and white flag at the yard-arm.

Middle ground.—Extending from the Inner bar for a distance of 3 miles up the river is the Middle ground, a shoal which divides the stream into two channels. Middle ground is increasing in height, and a great portion is visible at half tide. Gough island, now in process of embankment and reclamation, never covers; between this island and the eastern bank of the river is the narrow ship channel leading to Shanghai. Junk channel, south-west of Middle ground, is half a mile shorter than the ship channel but its upper part, at the tail of Middle ground, is very narrow, with only 6 or 8 feet in it at low water, so that it should only be taken with a rising tide.

Above Middle ground the river banks are of the same low character as at the entrance, and there is nothing deserving of more particular description than can be mentioned in the subsequent directions.

TIDES.—At the entrance of the Wusung river it is high water, full and change, at 0h. 40m.; springs rise 12 to 15 feet, neaps 8 to 10 feet, and neaps range 5½ feet. At Shanghai it is high water, full and change, at 1h. 30m.; springs rise 10 feet, neaps 7 feet, and neaps range 4 feet. Vessels drawing 18 feet can cross the Inner bar on the marks at any high water, but if of heavier draught they will have to wait for spring tides. The greatest draught ever brought up to Shanghai was H.M.S. *Imperieuse* (in 1862), drawing 24 feet.*

Company. Vessels are not allowed to anchor within half a cable to the southward of the line of beacons, nor between that line and the French Godowns.—Information from Chinese Imperial Maritime Customs, Notice 133 of 1881, and Consular Commercial Reports, China 1881, Part 2.

* In 1879 there were eight tides, giving 22 feet 6 inches at high-water. In 1881 five such tides, and one tide of 23 feet.—Letter from A. M. Bisbee, Divisional Inspector and Harbour Master, Imperial Customs, Shanghai, 1883.

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Abstract from Tidal Register.—Wusung Bar.*

Showing the Number of Tides of different Heights during each Month of the Year 1881.

Feet and Inches.																									Month.
12 to 12 6	12 6 to 13	13 to 13 6	13 6 to 14	14 to 14 6	14 6 to 15	15 to 15 6	15 6 to 16	16 to 16 6	16 6 to 17	17 to 17 6	17 6 to 18	18 to 18 6	18 6 to 19	19 to 19 6	19 6 to 20	20 to 20 6	20 6 to 21	21 to 21 6	21 6 to 22	22 to 22 6	22 6 to 23	23 to 23 6	23 6 to 24	24 to 24 6	24 6 to 25	25 to 25 6	
-	-	1	3	5	6	8	5	7	8	8	3	3	3	2	-	-	-	-	-	-	-	-	1	-	-	-	January.
1	-	1	1	3	3	5	6	6	7	8	5	7	1	-	2	-	-	-	-	-	-	-	-	-	-	1	February.
-	-	-	1	2	4	2	5	4	5	12	9	9	7	-	1	1	-	-	-	-	-	-	-	-	-	-	March.
-	-	1	2	1	-	1	3	4	5	8	5	11	5	10	2	2	-	-	-	-	-	-	-	-	-	-	April.
-	-	-	-	-	-	1	1	3	3	8	-	6	6	14	5	4	2	2	6	1	-	-	-	-	-	-	May.
-	-	-	-	-	-	-	-	-	1	2	9	13	9	6	2	7	5	2	2	2	-	-	-	-	-	-	June.
-	-	-	-	-	-	2	1	-	4	2	10	9	9	8	6	5	1	2	1	1	-	-	-	-	-	-	July.
-	-	1	1	-	2	1	4	2	2	4	4	6	6	9	5	3	4	3	2	1	1	-	-	-	-	-	August.
-	-	-	-	-	4	-	2	4	4	4	2	3	5	6	8	7	8	3	-	-	-	-	-	-	-	-	September.
-	-	-	-	-	1	2	4	-	3	1	8	3	5	6	8	6	7	3	-	-	-	-	-	-	-	-	October.
-	-	-	-	-	-	-	1	2	5	8	6	6	8	11	6	4	3	-	-	-	-	-	-	-	-	-	November.
-	-	-	-	-	-	-	1	3	9	11	5	10	1	8	9	3	1	-	1	-	-	-	-	-	-	-	December.
1	-	4	8	11	20	22	33	35	61	76	66	86	65	80	54	42	31	15	12	5	1	-	1	-	-	1	Totals.

During 10 months of the year 1881 the average A.M. tides, were higher than the corresponding P.M. tides.
At spring tides, the water on the Wusung bar only rises for 4 hours, and the neap tides for 5 hours.

* From the Remark Book of Navigating Lieutenant C. H. Hopkins, H.M.S. *Curacoa*, 1882.

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DIRECTIONS.—As pilots are always in attendance at the entrance it would not be prudent for a stranger to enter Wusung river without one, for the shoals which encumber it are constantly undergoing changes from alluvial deposits. When approaching the entrance, a peaked tower or pagoda near the small walled city of Paou Shan (*see* page 450), and just seen over it; will be observed to the westward, and this pagoda must be kept W. by N. ½ N. (but nothing to the northward of that bearing) to clear the shoals off the south side of the entrance, until Wusung lighthouse bears S.W. by W. ½ W. on which course vessels should steer in over the bar, and as soon as the north angle of Fort A. bears West, the course should be altered quickly to S.W., so as to pass Wusung lighthouse at about 1½ cables distant, after which keep the western shore on board at about 1½ cables distant, until the vessel is turned to port, for crossing the Inner bar on the leading marks. In entering, if the tower of the light keeper's dwelling is allowed to become shut in with Wusung lighthouse the vessel is over on the north bank. At night Wusung light shows white over the channel, a change to *red* or *green* denoting that a vessel is out of the channel and in danger. When entering, pass three-quarters of a cable from Wusung buoy (leaving it on the starboard hand), for the deep water channel here is narrow, and the bottom composed of hard substances.*

Vessels, except those of very shallow draught, should never be tempted by the apparent breadth and clearness of the channel to pass on the east side of the junks, which sometimes lie thickly anchored in the fairway below Wusung, but should either pass through the midst of them or near the western shore which is steep-to.

As vessels of large draught are obliged to cross the Inner bar at high water, whilst the flood tide is still running strongly, care must be taken to alter course in good time, (when the pole beacons bear about E. by S. ½ S.,) and not to allow the high pole to be seen southward of the low pole, for they are very close together. This caution applies with peculiar force to sailing vessels, for the flood stream sweeps up the river and towards the Middle ground with great strength, attaining a velocity of 4 knots an hour at springs and 2 knots at neaps. If intending to wait for high water, be careful not to anchor too near the bar, and if the vessel is of large draught it will be better to anchor below Wusung, so as to give plenty of time and room to turn; for with a strong flood a vessel may be abreast the bar before her head is in the right direction. No sailing vessel of any size should attempt to pass through the junks or across the bar in light winds if the tide is running strongly, and it cannot be too strongly borne in mind that

* Commander C. C. Rising observes, that after passing Wusung buoy, on the ebb tide, it is necessary to be careful that a vessel be not set too near the south bank, which shoals very suddenly.

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both flood and ebb streams continue to run for an hour to 1½ hours after the time of high and low water by the shore.

To cross the Inner bar in the deepest water, when proceeding to Shanghai; the low or western beacon should be kept in line with the high or eastern one. This will lead over the bar, on a course of N. 88° E., in the depth of water signalled from Customs station.*† When over the bar close the north shore to three-quarters of a cable, altering course as requisite so as to preserve that average distance along the east bank of the river. North of Gough island the channel narrows to about half a cable, and the northern shore at this part should be kept one cable distant (to avoid the shoal water extending from the north bank) until the west point of Gough island bears S.W. by S. After passing the first large creek, (bearing S.E. ¼ E. distant 9 cables from Gough island south extreme,) and when 8 cables south of it, the distance from the shore should be increased to 2 cables to clear a 15 feet spit which extends from the east shore.

An isolated shoal of 15 feet lies in about mid-channel at 3½ cables south of the above-mentioned creek.‡

Black Point§ is situated mid-way between Pheasant point and Shanghai. There is an old earthwork at the mouth of a creek a little higher up; a shelf extends two-thirds across the river from the western side at this part; the creek, however, should not be passed within a cable. Continue along the east bank at a moderate distance from the shore, until the houses of the foreign settlement at Shanghai are in full view, and after passing the lower wharves, if not intending to anchor to wait for the ebb tide, edge over W. ¾ N. towards the northern shore, steering for the new dock situated well below the American church (distinguished by its square tower), and keep well on the north side of the river until Soochow creek opens; after passing Pu-tung point (which has extended over 100 feet within the last few years, and requires great attention to helm), the course is mid-channel.

* In February 1881 there was 10 feet 11 inches water on this bearing; in November of the same year, owing to the periodical silting of the channel, there was but 9 feet 6 inches water.—A. M. Bisbee, Divisional Inspector and Harbour Master, Shanghai, 1883.

† A remakable tree shows clear to the southward of the high beacon.

‡ According to information received from Lieutenant H. Rolfe, R.N., this portion of the river bank has undergone considerable change; there being but 4 feet (with 2½ feet close to), at 125 yards from the *right* bank; at the position indicated by the following bearings: — High Beacon, N. 42° W., Twin Trees, N. 73° 20′ W., Black Point, S. 2° 20″ W., and south point of creek (Ka-jow), N. 6° E., 2·1 cables; the 3 fathom line at this spot being 135 yards from the shore. It is further stated that this shoal skirts the shore as far as Black point, and that the isolated shoal of 15 feet formerly existing, having disappeared, a wide berth may, with safety, be given to the bank.—From remarks by Lieut. H. Rolfe, R.N., H.M.S. *Albatross*, 1883.

§ The trees formerly on Black point have been cut away, together with part of the bank, and there is not now room for a ship of any size to anchor between Gough island, and the Bar beacon, vessels waiting for sufficient water over the bar, now anchor off Black point.—Navigating Officer's Remark Book, H.M.S. *Lily*, April 1881.

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In the lower part of Shanghai reach, fishing boats constantly anchor in a line across the river, but a passage through them is always kept clear. A vessel will generally pass southward of the shipping which lie in the upper part of this reach.

Vessels proceeding up the river with the last of the flood, generally anchor below the shipping and remain till the ebb stream makes down, which does not take place till 1¾ hours after high water by the shore; the flood stream makes about an hour after low water. Steam vessels therefore, or sailing vessels with a commanding breeze, crossing the Inner bar at high water or with a rising tide, will find the flood stream still strong in Shanghai reach, which is often so crowded with shipping that it would be almost impossible to pass through without collision; pilots are not allowed to bring a vessel up beyond the lower anchorage until they have ascertained from the harbour master where her berth is to be. Tugs are available for hire, by the employment of which the risks of collision, before so frequent, are in a great measure averted.

The space in front of the British consulate, at the entrance of Soochow creek, is generally clear of vessels and always looks inviting, especially at slack water, but it should be avoided, as the chow-chow water, caused by the sharp bend of the river at Poo-tung point, renders this locality insecure as an anchorage; the holding ground also is indifferent, the anchors are liable to come home, the water is 8 to 13 fathoms deep, and a vessel is constantly swinging round and round, so that whilst endeavouring to moor, before the swivel can be put on, several round turns may be taken in the cables.

The best berths are abreast and above the Chinese custom house, along the west bank of the river. The tidal streams here run with regularity and less strength, and a fairway along the eastern bank is left clear. Vessels ought to be moored with at least 36 fathoms on each cable, and a mooring swivel should invariably be used; a heavy fine is imposed on vessels neglecting this precaution. It is necessary to moor taut, as the anchors are generally found to come home after some time, and great care must be taken in laying the anchors, especially in long vessel, in order to ensure a clear berth.

There is a regular berth appropriated for the British senior naval officer's ship; the mooring buoy is off the custom house.*

SHANGHAI† is situate on the left bank of the Hwang-pu or Wusung river, 12 miles above Wusung. The port of Shanghai extends

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* Permission to use the buoys belonging to the Peninsular and Oriental Company (which lie southward of the senior naval officer's buoy,) can be obtained from the resident agent.—Remark Book of Lieut. J. W. Brown, H.M.S. *Hornet*, 1879.

† *See* Admiralty plan:—Shanghai harbour, No. 389, scale m=one inch.

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to Wusung, and the anchorage for foreign vessels, termed the harbour extends for 4 miles down the river. This is under the regulation of the harbour master, an officer appointed by the Chinese authorities, who retains a complete conservancy of the harbour, with its dues and customs, a condition which was ratified at the treaty of Tientsin in 1858. The harbour is divided into nine sections in which vessels lie three abreast and lettered according to their positions.* The upper limit of the harbour is about a mile above Soochow creek, where a mark is placed defining the foreign boundary.

Shanghai, is the most important centre of foreign commerce in China. It rose within a quarter of a century from the insignificant rank of a third class city to the fame and wealth of one of the chief commercial emporia in the world. It was always a considerable place of trade from the fact of its being the nearest seaport to the great city of Suchu on the Grand Canal, 45 miles to the westward. Situated on the delta of the Yang-tse-kiang, and having water communication with the whole empire, its site is most commanding. The name signifies "Upon the Sea," and although it is now 10 miles from the coast, Chinese annals state that it was once upon the seashore, and the low land which now intervenes has been gradually formed by alluvial deposits. For 50 miles around the city there is water communication with the interior in every direction, by the numerous creeks which intersects the neighbouring plain.

The foreign settlement is entirely distinct from the native city in its boundaries, government, and commerce. The latter is a walled city of irregular oblong form, a mile in length and half a mile broad. The French concession is northward of and contiguous to the city, and lies between it and the Yang-king Pang canal, it also embraces the northern suburb, fronting the river, and extending as far as the creek which leads to the east gate. At this part are commodious wharves, at which the large steam vessels which navigate the Yang-tse-kiang load and discharge, also the extensive premises of the Messageries Maritime, and above these extend the crowded lines of Chinese shipping.

The English concession includes all the other European communities and consulates, and lies between Yang-king Pang canal and Soochow creek.

The British consulate, a large square building, stands near the long bridge which crosses Soochow creek. The position of the British Consular flag-staff as established by Captain Chas. F. A. Shadwell, R.N., C.B.,

* Thus :—S Shantung side, C centre, P Putung side, O L outside limit; a list is published daily in the *Shipping Gazette*, so that any vessel in the river can be easily found.

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1850–58, was latitude 31° 14′ 42″ N., longitude 121° 28′ 55″ E. By the telegraphic determination of positions established under the authority of the United States Government 1883, Lieutenant-Commander E. M. Green,* U.S.N., places it in latitude 31° 14′ 41·31″ N., and longitude 121° 28′ 54·75″ E.†

The quay along the river side in front of the palatial residences of the foreign consuls and merchants, nearly a mile in length, is termed the Bund, in the centre of which, recognisable by its Chinese architecture, is the custom house, presided over by foreign inspectors. In this building are the offices of the harbour master, and of the engineer who (under the divisional inspector), has the superintendence of all matters connected with lights, buoys, and beacons.

The American concession, locally known as Hongkew, extends a mile up the northern bank of Soochow creek and along the river side eastward, where are situated two of the principal docks, the Sailor's home, and the offices of many of the leading firms of Shanghai. The Pu-tung side of the river opposite the American concession is also common to all foreigners. Above Pu-tung point is the depôt of the Chinese Imperial Maritime customs and look-out and signal station.

Eastward of Pu-tung point is situated the British cemetery, and close below the site of the Naval Depôt (now abolished), Messrs. Boyd and Co.'s new dock.

A gun is ordinarily fired from the senior naval officer's ship at mean noon, a red and white triangular flag being previously hoisted. Vessels can also have their chronometers rated by various firms on shore. The best observing place is the British consulate, near the flagstaff.

Docks.—At Shanghai there are six large decks; of these the largest is 450 feet long (over all), 80 feet wide at the entrance, with a depth of 18 feet over the sill at high-water ordinary spring tides; the other five docks vary in length from 400 feet to 245 feet, with depths of from 10 feet to 17 feet over the sills at high-water ordinary springs.‡

Trade.—Independently of an enormous traffic in general merchandise, the characteristic feature of Shanghai trade is the export of silk, for which staple this is the main entrepôt, and since the opening of the Yang-tse-kiang

* The whole of Lieut.-Commander Green's observations establishing and verifying secondary meridians, depend upon the longitude of the Government observatory at Madras, which has been placed by the officers of the Great Trigonometrical Survey of India, in longitude 5h. 20m. 59·42s. E., or 80° 14′ 51″ of arc.

† Telegraphic determination of longitudes in Japan, China, and the East Indies.—Bureau of Navigation, Navy Department, Washington, 1883.

‡ Captain R. H. Napier, H.M.S. *Magpie*, July 1880.

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to foreign trade, the trans-shipment of tea brought down from Hankow by steam vessels or of imports and Chinese produce for the various river and northern ports cause a great concentration of foreign shipping here. The entire trade amounted in 1881, to nearly thirty-nine and a half million of pounds sterling, the exports (besides tea and silk,) consisting chiefly of cotton and woollen manufactures, opium, metals, &c. The number of vessels that entered and cleared during the same year was 4,844, of which 2,631 were British; representing an aggregate of 3,690,241 tons.*

Population.—In 1881 the population of Shanghai was estimated at 302,767 of which 2,767 were foreigners.*

Supplies.—Shanghai water is very impure and sometimes brackish, containing a large quantity of organic matter, and its use is a fertile source of sickness to the crews of vessels.

Provisions are plentiful and moderately cheap, and the markets are well supplied with beef, mutton, game, fish, and poultry. Vegetables are considered unsafe articles of diet, in consequence of the practice of sprinkling them during cultivation with liquid manure, and fruit is of poor quality; rice affords the best substitute for vegetable diet.

Coals for vessels-of-war are sent alongside and put on board by coolies under a local contract.

Climate.†—The advantage enjoyed by Shanghai from its position in the temperate zone of China is in a great measure neutralised by its low lying site, scarcely raised above the level of the river, and exposed to noxious marshy exhalations. So long as the European population was thinly scattered, living in well built houses, and composed for the most part of a wealthy class, the sanitary defects of the locality were unnoticed, but with the first accession of a crowded and mixed population disease was rapidly germinated, and Shanghai became noted for unhealthiness. In July 1863 the native population were dying of cholera at the rate of 1,000 a day. It is therefore of the highest importance that officers in command should be prepared to adopt needful precautions. The application of dry heat for the cure of this terrible scourge has been found very successful (*see* page 351), and for this the boiler room of steam vessels affords great facilities. Properly filtered water is indispensable to health, and when mixed with oatmeal, for drinking purposes, has been found to be very beneficial. Rigid attention to diet should be strictly observed, excesses of every kind being in the highest degree prejudicial. Among the circumstances unfavourable to health are the rapid alternations of heat and cold, more

* Derived from commercial reports of H.M. Consuls in China 1881, Part II.

† Derived from the *Treaty Ports of China and Japan*, published in 1867.

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marked here than along the coast. The height of the thermometer throughout the year varies from 25° to 96° F.* and in spring and autumn a change to the extent of 20° or 30° in a day is not unfrequent. The annual mean range is 62°·5, the annual mean rainfall 50 inches. The influence of the south-west or summer monsoon is barely perceptible at Shanghai, although the prevailing winds at that season are southerly, and the absence of a tempering breeze is felt during the months of June to September. Throughout the autumn, winter, and spring seasons north-easterly winds prevail, with much rain and damp from January to April. The winter months are, however, tolerably salubrious, and in dry seasons highly enjoyable. Snow usually falls in December and January, when ice thick enough for skating upon is occasionally formed. April and May are genial months, the hot sun of noon-day being compensated by cool nights, but the four succeeding months are a season of general suffering and sickness. Owing to the wide range of temperature, the thickest clothing and furs are requisite during the winter, whilst in the summer months the thinnest fabrics are all that can be endured.

Barometer and Thermometer.—The mean height of the barometer in the spring and winter months is above 30 inches, and in the summer months below it, viz., from January to April, 30·25 inches; from May to September, 29·83 inches; and from October to December, 30·34 inches; ranging lowest with southerly winds and highest during the season of the northerly monsoon.

The rules for judging of approaching changes in the weather by the movement of the barometer which apply to the coast of China generally, hold good for the neighbourhood of Shanghai, a rapid fall betokening an approaching gale, and a high range the continuance of northerly winds.

The temperature by day and night, taken by a self-registering Fahrenheit thermometer in the open air in the shade at Shanghai, from 1848 to 1854, gives the following as the extreme ranges and the average mean temperature of each of the months for those years.

	Maximum.	Minimum.	Monthly mean.		Maximum.	Minimum.	Monthly mean.
	°	°	°		°	°	°
January	67	18	41	July	100	64	85
February	65	19	42	August	100	63	84
March	75	28	50	September	92	51	77
April	79	33	59	October	90	37	67
May	87	37	69	November	80	25	56
June	99	58	76	December	77	19	46

* From the observations of H.M.S. *Magpie* in 1879–80, the range of thermometer was from 26° to 98° Fahrenheit. On the 26th and 27th March 1880, the thermometer registered from 45½° to 72° F.

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Winds and Weather.—From a meteorological register kept at Shanghai, the prevailing winds from 1848 to 1854 appear to have been as follows :—

January	N.E. to N.N.W. (generally N.N.W.)	May	E.S.E. to S.S.E.
February	N.E. to N.W. (generally N.W.)	June	S.E. to S.S.E.
March	N.E. to S.E. and variable.	July and August	S.S.E.
April	E.N.E. to S.E. or S.S.E. and variable.	September	N.E. to E.
		October	N.E. to N.W.
		November	N.W. and variable.
		December	North to N.W.

January is in general fine at Shanghai. In February, thick fogs occur, and March is damp and disagreeable. April has more rainy days than any other month, except June. In May there is but little rain, and that little falls in heavy showers. July is hot, dry, and scorching, with much rain in the form of evening thunder-showers. July and August are the hottest months. In September the S.W. monsoon is wholly broken up, and the temperature is very changeable. In November the winter fairly sets in, the first frost appearing usually from the 12th to the 20th of that month. December is the driest month of the year, and the weather clear and freezing, though fogs are of occasional occurrence. In May, June, and July fogs also occur.

According to other accounts there are occasional S.E. winds in February with about one day in four rainy. In March it sometimes rains heavily for ten days almost continually. In April the N.E. winds greatly preponderate, and N.W. winds occasionally fill the air with dust; S.E. winds are less uncommon, and heavy rains occur towards the latter part of the month. In May fogs are prevalent, especially on the coast outside, where there is frequently a strong monsoon. In June the winds experienced are from all quarters, though rarely from the eastward, the strongest breezes being those from N.W.; the weather is changeable, fairly cool, seldom oppressive, and rainy or showery during half the month. In July the winds vary chiefly between south and east, and when accompanied with heavy rains the weather continues cool and healthy, but when sultry weather sets in, sunstroke, cholera, and other fatal diseases are prevalent, and care must be taken to avoid exposure to the sun, double awnings are imperative in July and August. August is excessively hot, and a period of much suffering afloat, for the temperature sometimes rises to 110° F. in the shade. In September N.E. and S.E. winds prevail, with a good deal of drizzling rain and occasional thunderstorms, and the winds generally have the character of sea breezes, freshening towards noon, and falling light at sunset. In the early part of October these breezes continue with fine clear weather, but are more northerly in direction; the prevailing winds are from N.E. and N.W., and when

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they veer to S.E. are generally accompanied with heavy rain and thick weather.

The strongest summer gales are those from the S.E., and they generally give good warning of their approach, the barometer beginning to fall sometimes as long as 24 hours previously. In December and January N.W. gales occur at the mouths of the Yang-tse-kiang; the barometer gives no warning of their approach, but they are preceded by light south-westerly winds accompanied by much mist, and gulls are seen flying in from seaward in large flights.

Typhoons rarely occur. In August 1871 one passed over Shanghai travelling to the north-westward, the greatest force of wind being 9 (Beaufort scale). Commencing at N.E. the wind shifted to W.N.W. and S.W. Many vessels afterwards arrived either totally or partially dismasted.

Wusung river above Shanghai.—On the 6th June 1862, H.M.S. *Vulcan* proceeded 35 miles up the river above Shanghai, and moored off the city of Sun-kong, in 16 fathoms. The least water obtained on the passage was 3½ fathoms (at nearly high water), but the shoal ground was not of large extent, and only two casts were obtained of that depth. The position of a fort at the entrance of the creek leading to Sun-kong was ascertained to be lat. 30° 57′ 45″ N., long. 121° 10′ E.

Tides.—At the entrance to this creek it was high water, full and change, at about 3h. 30m., rise 5 feet, but the tides were very irregular. At Ming-hong, 15 miles lower down the river, it was high water at 2h. 20m., and the rise 6 or 7 feet.

WUSUNG TO HANKAU.*

REMARKS.—For the first 80 miles above Wusung river the Yang-tse-kiang has a considerable breadth, viz., from 3 to 9 miles, but above that distance it contracts in width. As a consequence the channel is subject to continual changes, caused partly by the annual floods and partly by the ebb and flood streams flowing in different channels, the effect of which is to form vast flats, shoals, and middle grounds, which are frequently altering both in extent and position. Unless, therefore, the chart is kept constantly under correction it ceases to be a guide, and the services of a pilot are in most cases indispensable.† That part known as the Langshan Crossing is considered the most difficult part of the river, but it has been lighted and buoyed, as well as such other parts as are likely to cause embarrassment to the navigator.

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* *See* Admiralty plans:—Yang-tse-kiang, sheet 2, from the sea to Nankin, No. 1480; also, Yang-tse-kia, Shanghai to Nanking, No. 2,809.

† Experienced pilots can be obtained at Shanghai.

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In many parts of the river material changes have taken place since the surveys of 1858 and 1861, but the Admiralty charts are in the main accurate; the latest corrections of them may be obtained at the harbour master's office at Shanghai, and the sailing directions will supply information regarding those parts most liable to change.

In consequence of the great freshets that occur during the summer or rainy season, the Yang-tse-Kiang rises to an extraordinary height, covering its banks, and extending in some places several miles inland, thereby entirely changing its aspect, and assuming the character of a large lake. The navigation at such times becomes very difficult; while the downward stream, attaining a velocity of 7 or 8 knots, sometimes sweeps away the buoys and beacons: the channels undergo great changes, and shoals are converted into islands, or the contrary. At Hankau, in August 1861, the river is stated to have risen 38 feet above its low, or winter level. A good local knowledge enables vessels of small draught to avoid the strong ebb stream, by passing over the submerged lands. Flat bottom steamers drawing little water, and of high motive-power, are best adapted to the navigation of this river.

The several lights and light-vessels which have been placed at various parts of the river to facilitate navigation are maintained by the Chinese government, and are under control of the Customs. The positions of the floating lights are altered as occasion may require.

In the following directions, relating to the navigation of the Upper Yang-tse *below* Kiu-Kiang the zero of that port is used for indicating the drying of shoals and the flooding of the banks; between Kiu-Kiang and Hau Kau the zero of the latter place is used.

Above the limit of tidal influence the letters H.W. and L.W. indicate summer or winter water level.

COAST.—From Marecageuse point the coast trends N.W. for $1\frac{4}{10}$ miles to Paou-Shan point and then West and N.W. to Clump point. Foul ground extends for a considerable distance from the shore.

BUSH ISLAND CHANNEL; forms the fairway for steam vessels, bound from Shanghai or the southern coast to the ports of the Upper Yang-tse; it divides Bush island from the mainland.

The channel is about 5 miles long by nearly one mile in breadth, with depths in it of from 5 to 8 fathoms; its general direction is N.W. and S.E. There are several good marks on the Paou Shan shore, by which a vessel may at any moment correctly ascertain her position by cross bearings; but none exist on the north-eastern (Bush island) side until Bush island buoy is in sight.

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Paou Shan point.—This point bears N. 19° W. distant 1¾ miles from Wusung lighthouse. It is a round embanked projection and cannot well be mistaken.

Pou Shan shoal.—This shoal of 7 feet, which fronts the city of Paou Shan, and extends (within a depth of 3 fathoms) N.W. and S.E. for about 1½ miles, has its outer edge in 18 feet at half a mile N.E. of Paou Shan point. Its S.E. tail lies N. 33° W. distant 1¼ miles from Wusung buoy, and N. 9° E. distant 1½ miles from Wusung lighthouse; between it and the Paou Shan shore is a narrow passage carrying 16 feet.

Paou Shan pagoda.—At nearly 1½ miles N. 26° W. from Wusung lighthouse, and situated within the walled city of Paou Shan is a gable-topped structure, more resembling a joss house than a pagoda. It forms a good mark, and is visible from almost all parts of Bush Island channel, and the entrance to Wusung river; westward of it, and close to, are two joss houses or temples which stand out from the other buildings; and inland, bearing S.S.W. ½ W., distant 4½ cables from the pagoda is a conspicuous Round tree.

Strawstack tree.—This tree, remarkable from its form and general resemblance to Paou Shan pagoda, lies west of the latter distant 9½ cables, and is 4½ cables from the beach. It is conspicuous when seen both from the eastward and westward.

Trees.—A tree, or clump of trees, round-topped, and conspicuous from seaward, is situated N. 54° W. 2⅝ miles from Paou Shan pagoda.

Sloping clump of trees (also known as Clump, or Square clump,) cannot be mistaken. It is remarkable in form, the top having a very decided slope, totally unlike that of any other tree within many miles. It can be seen from a long distance, both eastward and westward, and is an important directing mark for vessels proceeding up the river. From Paou Shan point it bears N. 51° W. distant 3½ miles, and from the north-west extreme of Bush island S. 50° W. 2¾ miles (nearly).

BLONDE SHOAL, which dries; is the tail of a series of banks bordering the west shore, and its southern extremity is N. by W. 8½ cables from Sloping clump and 2½ miles W.S.W. of the north-west point of the Bush island. Its shallowest part is on the edge of the channel, which is steep-to, and a difficult part sometimes to make. Between it and the south shore is a narrow passage carrying 9 feet.

TSUNG-MING FLATS* border the western side of Tsung-ming north-westward of Bush island. They formerly extended 3 miles from the

* Two or three feet above water, the centre is covered with grass, and now appears as an island 2 or 3 miles long.—Lieutenant F. W. Barrett, R.N., H.M.S. *Cleopatra*, 1883.

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shore, and on them was a large dry bank with a channel inside. The outer part of these banks seems to have been washed away of late years since the main stream has discharged itself northward of Bush island.

DIRECTIONS.—After rounding Wusung buoy, steer N.N.W. (making due allowance for tide, and taking care to avoid Paou Shan shoal); when Paou Shan pagoda bears S.W., shape course N.W., which will lead in mid-channel, until abreast Bush island buoy with Sloping clump bearing S.W.

The course for the next 10 miles is N.W. northerly, holding rather nearer to the south shore, which may be estimated by the relative distinctness of the trees on either shore. Care is necessary with the flood tide not to bring Sloping clump eastward of S.S.E. till the Blonde is passed, as a vessel is liable to be set on the northern elbow of that shoal. Should shoal water be struck going up on the ebb, the vessel will probably have been set across the stream to the northward, on which side the shore is not at all steep, when Sloping clump bears eastward of South. The uniformly level banks of this part of the river, which are covered with trees, afford no landmark that could be recognised from description by a stranger, and the height of the embankments causes the houses and other objects in the rear of them to be hidden.

The most prominent and available for cross bearings are Paushan point and pagoda; Sloping clump on the point north-west of it; the north-west point of Bush island; the clump on Harvey point; the remarkable Fork tree and Great Bush on the west shore, and the clump of trees on Plover point.

Descending the river towards Bush island, beware of being set on its shoals by the ebb, which inclines across the channel, and makes very strongly through the channel north of that island.

The above are general directions, the latest particular directions are as follow:—Shaping a N.W. northerly course (so as to keep Lao point open on the port bow) for 13 miles, when abreast of Lao point, (which may be known by a high tree showing over a peculiar gap in the embankment,) keep in a little for Green point. The shore must then be kept abroad, for the Dove's Nest shoals only leave a narrow channel which is generally silting. Passing close to, and *west* of Actæon (red) buoy, steer for the Centaur lower (black) buoy, and from thence to the Centaur (black) buoy, taking care to avoid the 2½ fathoms spit which forms the east extreme of Centaur shoal. From the latter buoy stand W.N.W. for Plover point, passing it about 1 mile off, taking care not to shoal the water to less than 7 fathoms, and when it bears North steer W. ½ N. for Middle bank buoy. From this position the course should be held from buoy to buoy (leaving the red buoys on the starboard and the black buoys on the port hand when

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ascending the river,) until Vine point buoy is reached; when, steer N. by W. for North Tree beacon.

HARVEY POINT CHANNEL.—Harvey point, although no longer the western point of Tsungming, (Mason point, an island in 1842, being now joined to it by a low shore,) is still very prominent and easily recognised from the southward, from which direction a round clump of trees on the point shows conspicuously, but which is exceedingly difficult for even a practised eye to distinguish from the north-west.

If desiring to take the Harvey point channel, having run N.W. ¼ N. about 12 miles from abreast the north-west point of Bush Island, steer N. by W. for the point, which if not seen, a further run of a mile or two will rise it. This bearing of Harvey point will lead through the best water west of the Tsungming flat, and east of the extensive series of middle grounds, 15 miles in length below Plover point, the tail of which in 4¼ fathoms lies 5 miles South of Harvey point. This tail is shelving, and safer to touch on than the Tsungming flat, the edge of which is steep.

Pass Harvey point at three-quarters of a mile, and when the clump on it, which should be narrowly watched, bears E.S.E., steer W.N.W. until Plover point is seen bearing W. ½ N., and Single tree South, when steer W. by N. to pass northward of the Centaur black buoy, and about a mile from the point. Should the water be shoaled, it is well to bear in mind that the flood from the North Branch would probably set a ship on the northern side of the Actæon bank, the northernmost of the middle grounds, which is very steep-to, and that the ebb would set her against the north bank, which latter is shelving.

The NORTH BRANCH, which leads to the sea north of Tsungming, had been, to 1874, closing up at the rate of one foot per year since 1842, so that it is probable it may in time close altogether. One of H.M. gunboats endeavouring to explore it found it so intricate that she could not proceed. The flood tide through the north branch, which may probably make earlier than it does in the river, being so much nearer to the sea, may be to some extent the cause of the changes which are continually occurring in the Centaur and Actæon banks.

CONFUCIUS CHANNEL.—If proceeding up the river by this passage which is along the south shore, continue from abreast Bush island on the N.W. northerly course, gradually closing the shore to 1 or 1¼ miles, until abreast Dove's Nest buoy, red (when Harvey point should bear about N.E.), now steer N.W. ¾ W. up to Actæon buoy, after which follow the particular directions given on the previous page. This channel alters very frequently. Towards low water the banks are generally indicated by a "smooth." The lead gives no warning.

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BUOYS.—Dove's Nest Buoy is a *red* iron buoy, 10 feet in diameter, surmounted by a black spherical cage, and moored on the starboard side of the channel, and on the edge of the Dove's Nest shoal.

Actæon Buoy* is a large *red* iron buoy with black spherical cage, 11½ feet high, moored on the S.W. elbow of the Actœon shoals.

Centaur Lower Buoy* is a large *black* iron buoy with black spherical cage 11½ feet high, moored on the south-east end of the Centaur bank. It is necessary to pass westward of the red buoy and eastward of the black buoy. A straight course can be steered between them.

Centaur Buoy* is a large *black* iron buoy with cage 11½ feet high moored on the north-east end of the Centaur bank.

Caution.—The buoys on the Centaur and Langshan crossings are occasionally shifted as the channel alters. Red buoys are left on the starboard side and black buoys on the port, going up. The channel has altered since the buoys were placed in the positions given on the chart.

PLOVER POINT, about 16 miles N.W. by W. of Leo point, has a village on it, also a small fort or breastwork and a group of open trees. Many junks are generally at anchor in a creek-opening at this point. From this, if the weather be clear, Fu-shan will be seen to the westward in the shape of a hummock crowned by trees and a few white houses; a small fort, like a martello tower, (on the slope,) may also possibly be seen. It is said that at the high level season Plover point cannot be made out with any degree of certainty, in which case it is advisable to proceed cautiously, and feel the edge of the shoals.

FLATS and BANKS.—The following brief description of the flats and banks lying between Leo point and Lower waterman buoy, refers to 1882, but from their frequent changes no reliance can be placed as to the position of these shoals on any chart not quite recently corrected.

Dove's Nest and Actæon shoals.—A group of shoals and knolls, the chief of which cover at 6 feet rise of tide. Together they form a middle ground of some 10 miles in length, which separates the Harvey point, and Confucius channels.

Centaur shoal and bank, connected with the shore has its eastern limits marked by two buoys, it lies westward of the Actæon shoals, from which it is separated by a narrow channel.

The Langshan flats front the north bank of the river for about 12 miles north of Plover point, they are probably a middle ground, and are

* These three buoys lead over the Centaur crossing, but are "not" now considered "a good guide to the best water." C. P. Hicks, Navigating Officer H.M.S. *Albatross*, 1883. Lieutenant Tate, R.N. (*Vigilant*, 1883), gives the following directions. After passing the *red* buoy steer about N. ¼ W., until abreast Actæon buoy, passing which at least 250 yards off, steer for the Centaur buoy.

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very shallow in most places. The south-western extremity of these flats is now nearly 7 miles distant from the north shore, stretching across to within 2 miles of the south bank.

Middle and South banks form the western end of the Langshan flats. There is a knoll which dries at low-water spring tides, lying 2 miles from the river bank, with deep water between, and a narrow passage between this knoll and the north-eastern portion of middle bank, carrying 4 to 5 fathoms water, which is buoyed. The knoll and the shoal water surrounding it has been named South bank.

LANGSHAN CROSSING commences 6 miles above Plover point. It is so called from its leading across from the south to the north side of an extensive series of middle grounds which occupy the bed of the river from Plover point to Keashan point, a distance of 23 miles, and also from its being abreast a conspicuous landmark, a little inland on the north shore, the Langshan hill of two summits, 370 feet high, on the western of which is a pagoda. Its deep water limits are marked by the Johnson flats and Waterman bank to the westward, and the north bank to the eastward. Since the survey of Mr. W. Blakeney, R.N., of H.M.S. *Acæton*, in 1861, this crossing has undergone many alterations, for the river at this point, still flowing through an alluvial plain, opens out to a breadth of 9 miles, and as a consequence the channel and shoals are subject to constant change.

The following six buoys mark the passage:—

Middle Bank Buoy.—Black, with black spherical cage on S.E. extremity of Middle bank.

Middle Bank Upper Buoy.—Red, with black spherical cage on N.E. side of channel.

South Bank Buoy.—Black buoy with black spherical cage, on the north-east side of channel.

Langshan Buoy.—Red, with black cage, on N.E. side of channel.

Vine Point Lower Buoy.—Red, with black spherical cage, on edge of lower part of Vine Point shoal.

Vine Point Buoy.—Red, with black cage 18 feet high moored off the north-west edge of Vine Point shoal.*†

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* In consequence of the frequent changes which take place in the shoals at the Langshan crossing, these six buoys are liable to be often moved and a full description is therefore undesirable.

† Captains and pilots passing are requested to report any damage done to the buoys, and any changes in the positions of banks or shoals.

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North Tree Beacon and Light is on the north bank of the river above Vine Point. It is a *fixed*, dioptric light 65 feet above high-water, suspended from a single beacon pole, 73 feet high, surmounted by a wicker ball, and is visible 7 miles in clear weather.*

Rocks off North Tree Light. This cluster, the approximate position of which is S. 85° W. from North Tree Light and about 500 yards from the high water mark on the North bank of the river; have only 2 feet of water over them at low-water springs, during the lowest stage of the river with a depth of 18 feet close to on their outer side.†

Buoy.—A *red* conical buoy surmounted with a *black* spherical cage is moored about 100 yards south-westward of the North Tree rocks.

Vessels should not attempt to pass between this buoy and the left bank of the river.

TIDES.—It is low water, full and change, at the Langshan crossing at 10 h. a.m., and high water at 1 h. 40 m. p.m., or a few minutes later. Springs rise 12 feet, neaps 8 feet; and neaps range 4 feet. The flood at springs comes in with a slight bore. It is high water 3 hours afterwards, most of the banks cover at 3 feet rise, the Actæon bank covers at 6 feet rise; in the winter months the flood does not run so long, on account of the strong current down the river. The velocity of the flood stream is 5½ knots, the ebb attaining a strength of 6 or 7 knots. At springs there are only 3 hours *rising* tide, and 9 hours falling; at neaps 4 hours *rising*, and 8 hours *falling*, and which it is well to bear in mind in view of taking the ground. This does not refer to the stream, concerning which we have no precise information. It has been said that the flood stream makes at low water, but continues to flow some time after high water, but this is not very probable. In April the a.m. tides are higher by one foot than the p.m. tides.

DIRECTIONS for Langshan Crossing.—Passing Plover point at a mile, and steering westward, (according to the latest information that can be obtained regarding this part of the channel, which is the subject of such constant alteration that the chart can never be relied on), a run of about 3 miles will bring a vessel up to the Middle bank buoy lying off the south-eastern corner of the Middle bank, and the east point of entrance to the Crossing. From thence steer from buoy to buoy until Vine point buoy is reached. A straight course may be steered from the last named buoy for North tree beacon and light; and the North bank, which is steep-to round the bight, may be kept for 7 miles above Vine point. The buoys on the eastern side of the channel are *red*, those on the western side *black*.

* North Tree beacon light was in July 1884 shifted N.N.E. 290 yards from its former position, in consequence of the washing away of the embankment.

† From information received from the Imperial Maritime Customs, China, 1883.

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If, when coming down the river, the buoys should be displaced after passing Vine point, a cross bearing of Langshan pagoda and North tree beacon taken when the summit of the Muirhead hills comes in line with Fushan S.S.W., will indicate a vessel's position. The Muirhead hills are an isolated range 770 feet high, rising from the plain south-westward of Plover point, and these and Fushan and Langshan pagoda are admirable marks for cross bearings. Should the weather be thick the Crossing cannot always be taken with safety.

CAUTION.—During the summer inundations, the downward stream often attains a very great velocity, and sometimes sweeps away buoys and beacons; the channels then frequently undergo great changes and shoals are converted into islands, or the contrary, and the strong tides appear to be actively and constantly engaged in removing some banks while others are being formed. The navigation at such times is rendered extremely difficult.

LANGSHAN to KEASHAN POINT.—The position of the North tree and beacon light may be recognised by a broad creek 4 miles above Langshan pagoda. At 6 miles above this, edge away from the north bank (for this side begins to shoal), steering nearly mid-channel for *Kuishan* point (on which is Kuishan beacon and light), which may be passed at 2 cables; from thence again following the northern shore, until abreast the Tung-lo-tu beacon. At 7 miles above the creek is the commencement of Cooper bank, a dry shoal, covered with bushes and reeds and very steep-to.* On the south side of the channel, the disconnected shoals laid down on former charts have grown into islands (the largest of which, Pitman-King island, has villages, and is cultivated), with deep water close to, and which extend westward close up to Keashan point.

Keashan point is wedge-shaped and very conspicuous when seen from the south-eastward, the thick end 90 feet high being towards the river; pass it at about 5 cables, if using the light draught channel south of Centre shoal.

Kuishan Beacon and Light, (sometimes called Cooper island light,) on the upper end of Cooper island, known also as Cooper bank, is exhibited from a black pole surmounted by a wicker ball. The light which is visible 7 miles is 51 feet above high water, and the pole is 62 feet high. In October 1882 it was moved N.E. 500 yards from its former position.†‡

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* Lieutenent J. D. Deane, H.M.S. *Charybdis*, 1879.

† Chinese Government Light-list, 1883.

‡ And again 345 yards more eastward from this latter position, in October 1883.

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Tides.—H.M.S. *Styx* experienced a strong ebb all night when at anchor off Keashan point in June 1854, and it was supposed that the flood stream had no existence 10 or 15 miles below this point; this, however, must be considered to refer merely to that period of the year. From the fact of the river then having a large body of water in it, the downward current would naturally have greater weight, and check the flood stream; but in November 1858 the level of the river was lower, and the influence of the flood was felt much higher, and on 29th December, the level of the water being still lower, the flood stream was sensibly felt as high as Nanking.

Centre Shoal west of Kuishan beacon, forms a middle ground nearly 5 miles in extent running to the W.S.W. which divides the river into two channels, the southern of which is only used by vessels of light draught.*

KEASHAN POINT† to KIANG YIN.—After passing Keashan point and Centre shoal, the most anxious and dangerous part of the navigation of the Yangtse may fairly be said to have been accomplished, for in no other portion of the river do we find the same rapid alterations in the bed as in the vicinity of Fushan and Langshan. Above Keashan point is Mud island, westward of which the river becomes clear and deep, and a mid-channel course may be safely pursued, steering for the high-land of Hwang-shan, which, from Keashan point, looks like an island in the centre of the river; Tung-lo-tu beacon must however be passed close to avoid the shoal ground that has grown out from the opposite shore, narrowing the deep water channel at this spot to three-quarters of a mile. The hills in the vicinity range from 250 to 300 feet high.

The river narrows to less than a mile north of the point of the Hwang-shan hills, but immediately afterwards becomes wider. One mile S.W. of this point is the entrance of a creek leading up to the walled town of Kiang-yin, a mile inland in which is seen a pagoda. From the mouth of this creek, and extending 11 miles westward, the south bank of the river is bordered by a mud-flat nearly a mile in breadth.

TUNG-LO-TU BEACON and LIGHT on the north bank of the river W. ½ S. 6½ miles from Keashan point. Is a *fixed* light (dioptric, sixth order), exhibited from a black pole surmounted by a wicker ball, and visible 7 miles in clear weather.

TIDES.—The rise and fall of tide off Hwang-shan in December 1859 was from 4 to 6 feet.

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* This shoal is said to be growing fast and working down the river.

† Keashan point must not be confused with Kuishan point.

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KIANG-YIN to SILVER ISLAND.—From Kiang-yin keep the left bank or north shore of the river aboard, in order to avoid the broad flats off the south shore, which are steep-to, the water shoaling from 11 fathoms to 6 feet. When about 11 miles above Kiang-yin, the shore need not be kept so closely, and between Bate and Collinson points keep mid-channel for both sides are very shallow. Above Collinson point are Starling island on the west and Fishbourne on the east, both low, and occupying the centre of the river, which at this part is very broad. Hermes deep water channel, and which alone is navigable, is along the east bank, and should be steered for on a N. by W. ½ W. course as soon as Bate point beacon bears east. Extending northward 1½ miles from Fishbourne, is the *Manila* bank and island, and on the northern extremity of the bank is the wreck of the vessel of that name, which was totally lost on it when coming down with the current.

FISHBOURNE ISLAND LIGHT on Bate point,* east bank of the river, situated N.E. by N. 2 miles from Collinson point, is a *fixed* light of the sixth order, dioptric, visible 7 miles, and exhibited from a black single pole surmounted by a painted wicker ball. The spit or shoal at this point extends about half a mile into the river and the light is opposite the broadest part of the spit.

Four miles north of Manila island is Cruizer point and bank, the latter connected with the east shore. Just above Cruizer point is Pottinger island, 2½ miles in length, and between it and the west bank of the river is Pitman channel carrying over 8 fathoms water throughout. From abreast Cruizer point a course borrowing on the eastern shore may be steered, for the large tree (on the north bank,) which bears N.W. 2½ miles from the north end of Low island.

POTTINGER ISLAND BEACON and LIGHT is on the south extreme of the island. It is a *fixed* light, of the sixth order, dioptric, 52 feet above high water, visible 7 miles, and exhibited from a black single pole surmounted by a painted wicker ball.

Just above Pottinger is Kiying or Low island, a narrow strip 3 miles in length forming here the eastern shore† of the channel, being close to the northern bank. Five and a half miles above Kiying is Parker point on the south side, westward from which is Rose island, with its outlying shoals extending nearly across the river. The narrowest part is a mile to the

* The shoal off this point is said to be growing out, and extending to the eastward.—Lieutenant Deane, H.M.S. *Charybdis*, 1879.

† If proceeding without a pilot great caution is necessary, as the islands and shoals are very difficult to define, and are known to be constantly shifting and extending. —S. Spencer Smith, R.N., Lieut. and Com. H.M.S. *Cockchafer*.

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eastward of a creek-opening, after passing which it is necessary to sheer off from the north shore on account of a shelf lying a little above the creek. Between Parker point and its adjacent island westward, Rose island, a channel has formed having a depth of 10 feet at low water. This channel is now used by large river steam vessels. Four miles above Parker point is a hilly point under the conspicuously elevated Chusan pagoda,* and two miles above this is the Espiegle rock, 2 cables off a projecting point of the south bank. Pass this spot in mid-channel, for the opposite shore is bordered by a shoal, steep-to, and extending 1½ miles below the custom-house. Keep the north shore for 2 miles above the custom-house, and close past the mouth of an arm of the river leading to the northward, taking care to avoid the shoal water off its western entrance, and when about half a mile above this arm, edge over into mid-channel again, having thus avoided the Calliope shoal extending from the south bank more than half way across the river.† When 2½ miles above this arm, the Calliope will be passed, after which the channel is clear up to Silver island, but it is well to keep nearer the south shore owing to the changes which are taking place on the northern side of the river.‡

TANTU BEACON and LIGHT is on the south bank, E. by S. 1½ miles, from the village of Tantu, and 5½ miles below Silver island. It is a *fixed* light, sixth order, dioptric, visible 7 miles, and exhibited from a black single pole surmounted by a painted wicker ball.

Between Kiang-yin and Chusan pagoda the banks are flat and excessively monotonous, the only rising ground being the Keunshan hill, on which are some houses, seen nearly ahead from the reach below Fishbourne island.

SILVER ISLAND or Tsiao shan, at a bend of the river 12 miles W. ¼ N. of Chusan pagoda, is the first island met in the Yangtse which is not altogether alluvial. The eastern end is flat, but the western is a wooded hill or bluff, 225 feet high, surmounted by a low pagoda. In passing Silver island the southern channel is always taken. This channel, the dangers in which reduce it to one cable in breadth, (though it is nearly three from shore to shore,) is less subject to change than other parts of the river, being narrow with rocky bottom. It was in 1877 sounded by the

* The Sha-yo-ho, a creek leading from this point to Starling island, and which formerly carried from 5 to 7 fathoms, is now closed.

† H.M.S. *Vigilant*, grounded (in 1880) on a mud bank on the right bank of the river, and opposite the creek at the S. end of Chang-sang-chau. It is about E. by N. 1¾ miles from Tantu beacon, but it is doubtless of a temporary character.

‡ Siau sha, the lowest of the three alluvial islands below Silver island, and formerly 3 miles in extent, is stated to have been entirely washed away. Through a creek near the Calliope shoal there is boat communication with Shanghai.

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German vessel-of-war *Luisa*, and the chart found correct, with the exception that the 3 fathoms spot in the middle of the channel was not found, but a patch of 15 feet was found 120 yards E.S.E. of the 3 fathoms spot marked upon the chart; the 15 feet patch lies about 100 yards from the shore. A white mark was painted on the rocky wall opposite the patch, an exact mid-channel course will lead clear through. There are in all four known dangers;* the *Furious*, sunken rock† which forms the southern limit of the reef projecting from the south point of Silver island, of 13 feet water, and only 6 feet when the river is low, lying one cable from the island S. by W. of the summit; *a 3 fathoms rock*, terminating some broken ground on cable N.W. of the easternmost rocky point on the south bank opposite; the *Luisa* rock above alluded to, and *a 5-feet rock* situated approximately N.E. by E. ½ E. from Furious rock, and S.S.E. ½ E. 325 yards from Silver island pagoda. Between the two former of these rocks the depth mid-channel is from 6 to 11 fathoms, passing the point on a W. by S. course. A quick helm is required in passing through, to avoid being at the mercy of the whirling eddies caused by the check these submerged rocks oppose to the current.

In 1858 Silver island appeared to be forming a junction with Ta-sha, eastward of it, and a spit then ran out from the low flat tongue of ground which has accumulated to the north-eastward of the high ground of Silver island towards Ta-sha; while another appeared to be working its way from Ta-sha towards Silver island, and the channel between the two was clearly filling up, as the chart of 1842 shows 12 fathoms; but only 4 fathoms was then found, and the passage had become so narrowed, that it was not deemed prudent to take H.M.S. *Retribution* through. This, the north-eastern channel, having now barely 3½ fathoms at the part above mentioned, is otherwise broad and deep, and Feather islet, (the white rock 25 feet high, north of Silver island) is bold on either side; it is occasionally used in winter, but at *high water only*.

CHINKIANG FU, Treaty Port, accessible by sea-going vessels of the heaviest burden, is situate on the right bank of the river, 2 miles above Silver island and 170 miles from the sea. It is a walled city about 4 miles in circuit and half a mile from the bank of the river, the

* A shoal of 15 feet (L.W.) has recently been reported lying E.S.E. 3 cables from the Pagoda. It is 2 cables in length (in an E.N.E. direction) and half a cable in width. —C. P. Hicks, Navigating Officer, H.M.S. *Albatross*, 1883.

† *See* sketch of Silver island, on Admiralty Chart of the Yangtse, No. 1,480. The bearings from H.M.S. *Furious* when aground on the reef extending to the southward from Silver island were:—Golden island pagoda, W. by S. ½ S.; extremes of Silver island, N.E. ¼ E. and N.W. by N. At two ships' lengths south-east of the reef there is a rock with only 16 feet water on it.—Captain Sherard Osborn, R.N., November 1858.

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space between having been formerly covered with an extensive suburb, which was surrounded by a wall during the rebel occupancy of the city, so that the fortifications now extend to the water's edge. The Grand canal winds past the southern and western faces of the city to its point of junction with the river.*

The foreign settlement extends along the river side above the city, from the custom house at the mouth of the Grand Canal as far as Yin-shan, a steep acclivity on the west,† where is situate the British consulate, formerly a Buddhist temple. The settlement is entirely level and divided into 18 lots, nine of which are on the Bund fronting the river, and separated from the remainder by a road parallel to it.

The river is deep at this part, there being 27 fathoms at 300 yards, and 15 to 20 fathoms at 100 yards from the shore. The current runs along the south bank with extreme rapidity, preventing the anchorage of hulks for floating residences, and rendering it impossible for steamers to anchor or to lie off under steam with safety. On the north shore the water is shallower and the current less rapid.

The entire native trade has, in consequence, been diverted from Chinkiang to Kwa-chau, but in order to restore it an enormous canal or dock has been dug out, immediately above the foreign concession, and a proclamation issued ordering all native vessels laden with produce, salt only excepted, to anchor within the dock or on the south shore.

The Grand Canal enters at the upper part of the city, passes along its west and southern sides, where it is now overgrown or filled with rubbish, and re-entering the river, terminates at Tan-tu about 4 miles below Silver island. Its junction with the Yangtse from the north is opposite Chin-kiang, and on it, a little above, is the town of Kwa-chow, the central station at which salt brought from the coast is trans-shipped. This trade, which gives employment to 1,800 junks and 30,000 men, is a Government monopoly, and foreigners are prohibited by treaty from engaging in it, or even assisting in it by towing the salt junks. Access to Kwa-chow and to the course of the Yangtse above it is facilitated for native boats, which would with difficulty stem its rapid current in the channel near Chinkiang, by a line of interior canal connecting the northern mouth of the Grand Canal with a point some 15 miles below Chinkiang, but running northward into the interior, so as to form an extensive loop.

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* *Treaty Ports of China*, p. 420.

† This is the true Yin-shan or Silver hill, a name which has been erroneously applied to the island of that name in the river below.

‡ By Li-hung-chang, acting Governor-General of the two Kiang provinces.—J. M Hockly, Esq.

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At the point where this channel joins the Yangtse is situated the village of Sien-niu-miao, which gives its name to the creek, and which was the centre of an active trade on the part of foreigners previous to the opening of Chinkiang, and now continues to be a centre for an important section embracing the cotton export from the producing districts north of the Yangtse.

The Grand Canal became first impassable in 1851, when the Yellow river changed its lower course from the eastward to the northward, and the subsequent series of inundations of the river have caused the damage to the canal to be almost irreparable.

Climate, Winds, &c.—In climate and temperature there is little difference between Chinkiang and Shanghai, but the hilly surroundings of this port are an advantage Shanghai does not possess, and are undoubtedly conducive to health. Fever and dysentery, the diseases inseparable from situations of this kind, are prevalent during the summer. The winter is bracing and game abounds in the vicinity.

The winds observed in January are from N.N.E. to N.W. with strong westerly breezes. Heavy falls of snow occur, and some frost. Early in the month a gale commenced at East, and veering by North, terminated blowing heavily from West with a snow storm. February brings bright clear weather, with occasional falls of snow, and occasionally a strong S.W. wind and sand storm.

In June the winds are from southward and eastward early in the month; then from South and West, force 1 to 8; rain every third day. In July they are southward of East and West, but generally from S.W. force 1 to 6 *bc*; a few wet days early in the month. In August, generally from southward, with occasional east winds; strong squalls from north; force 1 to 8 *bc*, with occasional wet days. In September, N.E. and S.E., and from S.W. at end of month; force 2 to 9 *ocq*; many wet days.

In October, N. and N.E., and occasionally N.W.; force 2 to 5 *bc*; little rain. In November, variable; force 2 to 8 *bc* and *oc*; five wet days. In December, variable; force 3 and 4 *ocgqr*; several wet days, snow one day.

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The annexed Meteorological Table is taken from the Trade Report of Mr. Consul E. L. Oxenham for the Year 1880 :—

Month.	Thermometer.				Rain Fall.				Tides.		Remarks.
	Highest by day.	Highest by night.	Lowest by day.	Lowest by night.	No. of days' rain.	No. of days' snow.	Rain Fall.	No. of days' fog.	Highest above winter L.W. level.	Lowest above winter L.W. level.	Weather generally.
1880.							Inch.				
January - -	44	42	25	24	3·00	8·00	1·77	—	5·05	1·04	First part of month fine; rainy and snow from 10th to 24th, then fine. Prevailing winds N.E. and N.W., 22 days.
February -	44	45	32	30	3·12	2·00	2·28	1·00	8·10	0·01	Prevailing winds N.E. and N.W., 24 days. Snow on 4th and 24th. Few fine days, mostly rainy and dull.
March - -	72	67	35	34	4·00	—	1·78	1·00	8·02	2·02	Prevailing winds N.E. and S.E. 24 days. Very fine, little rain. Thunderstorm on the 18th.
April - -	73	71	47	43	5·03	—	5·00	—	10·00	1·06	Prevailing winds N.E., N.W., and S.E. for 10 days. Very fine, with a little heavy rain. Heavy west gale on 22nd.
May - -	82	80	55	54	3·18	—	0·84	2·00	10·07	2·03	Prevailing winds S.E. and S.W. Heavy N.W. gale on 30th. Very fine; occasional thunderstorms.
June - -	86	83	68	62	1·00	—	0·84	—	11·11	3·02	Prevailing winds S.E. 15 days, N.W. 5 days, N.E. 4 days, S.W. 4 days: very fine. Total eclipse of moon on 22nd. End of month stormy.
July - -	88	88	69	70	2·18	—	3·37	—	15·03	9·04	Fine, with thunderstorms. N.E. 15 days, S.E. 6 days. Cool.
August - -	89	85	68	68	2·21	—	2·22	—	14·02	9·05	Very fine, light showers. Winds N.E. 22 days (unusual.)
September -	85	83	67	66	2·00	—	1·65	1·00	13·05	9·01	Very fine, little rain. Winds N.E. 15 days, S.E. 10 days.
October - -	76	72	50	50	1·09	—	0·59	2·00	13·09	5·07	Very fine. Heavy N.E. gale on 25th. Winds N.E. 15 days, S.E. 13 days.
November -	65	63	29	28	0·06	0·12	0·08	—	10·04	0·06	Winds N.E. and N.W. 18 days. Fine, cold, and windy occasionally; one day snow. Heavy N.W. gale on 7th and 25th.
December -	53	48	24	22	1·06	2·03	1·24	0·12	6·09	1·10	Fine. Four days snow, slight. Heavy N.E. gale on 18th, with rain and sleet. Winds N.E. and N.W. 23 days.
					27·03	12·15	21·66	7·12			

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Supplies, Trade.—The following is a list of market prices: Beef, per pound 8 cents, mutton 12 cents. Vegetables and fruit are cheap, fish of good quality, plentiful. Firewood may also be obtained. Flour and potatoes are imported from Shanghai, as are all stores, wine, &c. by the steamers passing two or three times a week. Accounts are kept in taels.

The early expectations formed of the development of an important trade at Chinkiang were not at first realized. The destruction of the Grand Canal, and consequent cessation of the through traffic between Peking and the great cities of the south, caused the extinction of the trade which once flourished at this place, whilst the expectation that Chinkiang would become the shipping port at which seagoing vessels would load the teas of the interior was neutralized by the opening of Hankow. Since 1870, however, the resettlement of the country, which had been desolated during the Taiping rebellion, and the cultivation of tea, silk, and cotton, have giving an impetus to trade, and at its present rate of development Chinkiang bids fair to become, in a few years, one of the most important emporiums of the foreign import trade in China. In 1880 the gross trade of the port is placed by Her Majesty's Consul at 4,156,563*l.*, net trade at 4,110,479*l.*, and the export trade at 548,813*l.**

The total number of vessels entered and cleared during the year 1880 was 3,051, representing a tonnage of 1,777,066 tons.*

There are two coal mines about 20 miles distant, towards Nanking, near a navigable creek, one at Ku-tsze-tan, the other at Pa-whei-li-miao.

ANCHORAGE.—On the left bank of the river, between Silver island and until abreast the entrance of the Grand canal opposite Chinkiang a bank of mud and sand runs off, covered at high water even when the river is low. It is about half a mile broad at its greatest breadth, which is near a canal on the left bank, abreast a high bluff on the opposite shore, on which is a small iron pagoda and some houses.†

The best anchorage is on the north side‡ of the river, just westward of this bank, abreast the western corner of the city, in 5 to 9 fathoms, for there is less tide on the north side than near the city. The only anchorage on the city side, on account of the great depth of water and strength of

* Report of E. L. Oxenham, Esq., Her Majesty's Consul at Chin-Kiang, 1880.

† The remarks on the anchorage, tides, and winds, at Chinkiang, are by Lieutenant Franklin, and Mr. Panter, H.M.S. *Banterer*, 1861. Lieut. Whish, R.N., records that the flood tide was felt in January 1873 daily for three hours, with a rise and fall of about 5 feet; in February ships in mid-stream swinging to the flood for the same period.

‡ Considerable alteration is taking place at this part of the river. The salt junks which in 1870 used to anchor at Kwa-chow, 1½ miles up the river, were compelled in 1871 to anchor on the north bank, opposite the settlement, in consequence of the washing away of Kwa-chow point and the formation of chow-chow water.— *Chas. Gardner, Esq.*, of H.M. Consulate.

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the current, is in a small bay formed between Golden island and a bluff about half a mile eastward, where near Golden island the depth is 9 fathoms; abreast the city it is not less than 15, suddenly deepening to 25 and 27 fathoms, and off the Concession the ground is rocky, and there is chow-chow water. The strongest winds are from North and N.E.

Chin Kiang Shoal, lies about 1 cable from the shore, and ½ a cable eastward of the Middle Hulk, nearly opposite the Custom House. It is composed chiefly of loose stones, and has about 5 feet water over it, when the river is at its lowest winter level.*

TIDES.—At Chinkiang the water in the river begins to rise about the first week in February, and attains its greatest height about Midsummer, from which time until Michaelmas there is a general uniformity in its rise and fall, and the north bank of the river is sometimes submerged. From Michaelmas it gradually falls till February. The rise and fall is about 3½ feet at springs and 2¾ feet at neaps.

The greatest strength of the down stream in mid-channel off Chingiang was 3½ to 4 knots; off Silver island 4½ to 5½ knots. It was strongest in June and July, after which it gradually decreased in strength. The weakest tides are in December, January, and February; vessels swing for a short time to the flood, if there is no wind, until the middle of February,† after which the tides gradually increase. The water rises from 15 to 18 feet above its lowest level in the summer months at Chinkiang-fu. The current runs from 1½ knots to 2 knots in winter and from 4 to 5 knots in summer with occasional freshets of 5 to 6 knots. During the summer the tide has little effect raising the river about 2 feet and checking the down current slightly. In the winter at springs the water rises about 6 feet and the tide runs up from 1 to 1½ knots per hour. N.W. winds keep the flood tide back considerably.

GOLDEN ISLAND, or Kinshan, an island in 1842, now forms the extremity of a low grassy point; it is an isolated rock covered with temples, with a slender pagoda on its summit. The point opposite the island, as well as the bank on that side, may be approached to 50 yards, but the eddies off this point and above it are very strong‡ and there is a rock close to its eastern side.

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* H. R. Robinson, Navigating Officer, H.M.S. *Espoir*, 1883.

† Considerable alteration is taking place at this part of the river. The salt junks which in 1870 used to anchor at Kwa-chow, 1½ miles up the river, were compelled in 1871 to anchor on the north bank, opposite the settlement, in consequence of the washing away of Kwa-chow point and the formation of chow-chow water.—*Chas. Gardner, Esq.*, of H.M. Consulate.

‡ In 1828, Golden island was on the north shore; in 1842 it was in the centre of the river; it is now on the south bank, 2 miles from the shore.

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Marion Rock,* lying about a mile W.N.W. of Golden island, is about one-third the distance over from the south bank, and in March had only 4 feet on it, which, allowing for the rise of the river in July, would agree with 10 feet found upon it at that time by H.M.S. *Rattler*. In December it is 2 to 4 feet out of water. It lies N. of a creek on the right bank. Vessels in passing should close Kwa-chau on the N. bank, the islands about which, shown on old charts, do not now exist, and when a peculiar arched bridge over a creek on that side is well open the rock will be abeam.

Between Kwa-chau (where the bank is washing away) and Pih-sin-chau (Deer island,) beacon the navigation is intricate, and the channel hereabout frequently changing. In making for Saltown point great caution is necessary to avoid a bank that dries, and extends for fully 4 cables from the south shore, and also the spit running out from the east end of Pih-sin-chau which reduces the passage at this part to about 1 cable broad: now keep the south shore aboard until past the south point of Pih-sin-chau after which a mid channel course is to be preferred until clear of the island and also through the short reach to the westward, where the banks extend from both shores nearly up to Morrison point, 5 miles above Pih-sin-chau. At 2 miles west of Bethune point the bank extends for fully 6 cables from the south shore.

PIH-SIN-CHAU LIGHTS and BEACONS.—On Pih-sin-chau, an island directly west of Saltoun point and 5 miles in length, are two lights. Pih-sin-chau light, on the ower or east end of the island, is a *fixed* light exhibited from a single black pole surmounted by a wicker ball, and is visible 7 miles; and Bethune point light, on the upper or west end of the island, a *fixed* light, also visible 7 miles, and exhibited from a similar structure. Both lights are dioptric and of the sixth order.†

Pih-sin-chau.—The passage north of Pih-sin-chau, although more direct, appears to have irregular depths, and to be filled with sand-banks, it is subject to frequent alterations, and should, therefore, be navigated with caution. During the winter months the least water in it is 8 feet.

The spit at the eastern end of Pih-sin-chau has become part of the island. The shoal ground off the small island in the east entrance of this channel has extended to the southward and to the westward. A spit has formed off the eastern creek on Pih-sin-chau island and extends about 1½ cables from the shore and 2 cables eastward of the creek. The western

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* A red buoy is stated to have been placed over the rock by a Chinese Guild.

† These lights are occasionally moved according to the state of the banks. In June, 1883 Bethune point light was shifted about 100 yards E. ¼ S. (approximately) from its former position in consequence of the washing away of the point.—Chinese official notice.

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part of the bank south of I-chang has disappeared and the eastern has extended, and obstructs to a great extent the channel north of Bethune point.

From the eastward, entering the channel north of Pih-sin-chau, approach the south or island shore to within 250 or 300 yards, and when about 2 miles past the beacon steer W.N.W. for the junk anchorage off Ichang, and thus gradually cross the channel; then steer parallel to the line of junks until the water begins to shoal, when the course should be altered to the southward so as to skirt the bight eastward of Bethune point at a distance of 150 or 200 yards from the bank; the deep water is on the port hand.*

Native boats use this northern cut-off at all seasons, but the southern channel is alway used by steamers of large draught.

Rocks and Bank above I-chang.†—Nearly abreast Morrison point and almost exactly in mid-channel, is a rocky ledge lying midway between the custom house of Lung-wang-meau and that situated at the entrance to the creek 4 miles west of it, the 2 fathoms line of the bank here narrows the channel to 3 cables, and all to the north of it is shoal.‡ There is also a shoal 2 or 3 miles above these rocks with 4½ fathoms on it with Ning-gan-shan pagoda N.W. by W. and Single tree hill on the right bank S.W.

Avoiding the above shoals a mid-channel course may be kept to Cornwallis bluff on the south bank, 12 miles above Morrison point, but on passing the next point opposite and 1½ miles above the bluff, keep rather to the northward of mid-channel, to avoid an outlying rock said to exist between the Yen-tze-ke hills and the entrance of Tsauhia creek. The northern shores and banks off Tsauhia island have greatly extended, and the water has deepened along the north bank of the river, which must be kept until Pagoda point bears south, after which it is shoal, but the centre of the river is quite clear up to Nanking.

Theodolite point, the south extreme of Tsauhia at the upper entrance of the Cut-off and immediately below the city, may be approached closely, the beach being steep-to, and so also may the two forts on the right bank erected on the detached tongue of land in front of the city walls. Above Nanking point, on the opposite side of the river, is a small battery. Vessels forcing a passage should keep close in to the right bank of the river. After passing Nanking, a mid-channel course may be steered for

* Navigating Sub-Lieutenant W. J. Barnard, H.M.S. *Curlew*, 1876.

† I-chang or I-ching.

‡ I-chang rocks are nearly dry at low water. The sandbank in shore dries at very low water.

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Hea-Sanshan bluff. When opposite Wylie point, as little as 4½ fathoms water will be found in mid-channel.

MUD FORT BEACON and LIGHT, on a low point on the North bank of the river 21 miles from Bethune point, and 1¾ miles W.N.W. from Cornwallis bluff, is a single black pole (surmounted by a wicker ball), from which is exhibited a *fixed* light visible 7 miles. Its use is to define the point, which being low and flat is frequently at night hidden in the shade shown by the high hills, Wuhung-shan, forming the south bank of the river.

Tsauhia Creek, known also as the Nanking creek or Cut-off, and which saves 3½ miles of distance, has good water through, even when the river is lowest in winter. It carries 6 to 8 fathoms in most places, and not less than 4 fathoms at the shoalest part near its lower end. On both sides of the channel at entrance (a formation said to be common to all the creeks and canals) are banks extending 200 yards which are visible in winter, but require caution to avoid in summer when the water is high. By a recent regulation this creek has been closed to foreign vessels, and is now used only by native craft and vessels flying the Chinese flag.*

NANKING,† or Kiang-ning fu, the provincial capital of Kiangsu and the second city of the empire, is 44 miles above Chinkiang, 198 miles from Shanghai, and 230 from the sea. Although not at present a treaty port, it is nevertheless specified in the French Treaty, concluded at Tienstin in 1858, among the river ports eventually to be thrown open, and on this account claims a brief description.

Nanking was till the commencement of the 15th century the metropolis of the empire and the seat of the Chinese court, for which by its situation it is eminently adapted, and the ruins of an ancient wall which can be traced for 35 miles in circumference testify to its former magnificence. It became famous in modern times, in 1842, when the Chinese were compelled to submit to the terms of peace‡ imposed by the British force; and still latter as the head quarters of the Taiping rebellion, the leaders of which took the city by assault on the 19th March 1853, and continued to hold it until 19th July 1864, when Major Gordon, R.E., having successively crushed all the outlying rebel forces, it was recaptured by the imperial troops under the Viceroy Tseng-kwo-fan.

The city is surrounded by a wall of irregular, triangular shape, 17 miles in circuit, and from 50 to 70 feet high. Of its 17 gates, all but six have been built up. The north-west gate is about a quarter of a mile from the

* Com. C. C. Rising, R.N. says that this regulation only alludes to merchant or any large steam vessels, as in some places the turns are rather sharp, and many junks have been run down. A notice in Chinese characters is posted up at each end of the creek.

† *i.e.* "Southern Capital." ‡ 29th August 1842.

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river at the entrance of the Cut-off, the space intervening being occupied by moats and ruined suburbs partially walled in by the Taipings, and some batteries thrown up on the river bank. A very small part of the space enclosed has been built on, and there is much park-like woodland, and waste within the city. The inhabited portion of the city lies towards the east and nearly 5 miles from the river.

There are hills of some elevation, particularly on the west side of the city, where the scarped sides of the crooked line of heights form a natural wall of red sandstone. Between the west wall and the river are a series of moats and fishponds. A moat also runs from the river to the west gate, and continues along the wall to its south-west angle; the south gate is more easily gained by this; it is under the steep hill without the city near the site of the once celebrated Porcelain pagoda. The Taiping gate is on the north-east side, under the hills, where are the remarkable tombs of the Ming dynasty, near the east end of a large sheet of water, banked in by masonry.

Although converted, immediately after its re-capture in 1864, to its former position as the seat of the vice-regal government, Nanking* shows comparatively little sign of revival from the state of desolation in which it was left by the action of so many years' continuous warfare. It has, indeed, been made the seat of a large military force, and also of an arsenal for the manufacture of cannon and other warlike stores on European models, under the direction of Chinese officials aided by foreign employés: but even the slight importance the city formerly possessed as a centre of trade and native manufacture has not been revived. As a place of trade for foreigners Nanking presents no features of advantage, and labours under the drawback of a peculiarly unhealthy climate. During the stay of H.M.S. *Centaur*, from the 28th February to the 27th September 1861, the weather during July and August was extremely trying, the thermometer 99½° under a double awning, and at night 90°, with myriads of musquitoes. The crew of the *Centaur*, from being one of the most healthy on the station became quite the reverse, having from 40 to 50 daily on the sick list, and many deaths from dysentery and fever.

ANCHORAGE.—The anchorage of Nanking is on the right bank south of Theodolite point in 7 to 10 fathoms, muddy bottom, good holding ground and room for 5 or 6 large vessels within 200 yards of the beach. At 100 yards outside this there are 15 to 20 fathoms, and a much stronger tide; on the opposite shore 4 to 10 fathoms, with little tide. It is advisable to have two anchors down to prevent sheering in strong N.E. or N.W. winds.

* *Treaty Ports of China*, p. 428.

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TIDES, and Levels of River.—It is high water, full and change, at Nanking approximately at 11h. 0m. the rise being about 4 feet.

Between 6th and 22nd March the river fell 5½ feet; winds mostly from East, E.S.E., and N.E., fine dry weather. On the 22nd the wind was S.W. force 5, and on the 23rd the river rose to its old level. On 24th May the river began to rise rapidly till the latter end of June, when it had risen 12 feet, the surrounding country being mostly under water, whilst at Chin-kiang it rose only 6½ feet. On 14th July a change was perceptible and the water slowly began to recede. On the 27th September it was but 5 feet above its usual level. The range of tide at Nanking is about 4 feet at spring tides in the winter months. Ships swing to the flood for a short time. During the summer months the tides have no effect.

ABOVE NANKING* the reach, 13 miles in length to Shanshan bluff, is clear if a mid-channel course be steered, taking care to give a good berth to the shoals which extend 1 mile southward from Wyllie point (the upper end of Me-tsze-chau island), and join the main land at the first creek south of the point. In summer the tide sweeps past Wyllie point with excessive force, causing much chow-chow water. The creek eastward of the latter carries good water except at its upper outlet opposite Wyllie point, where is a bar of 6 feet, probably hard bottom. It is chiefly used by junks.

ELGIN REACH.—Hea Shanshan is a bluff on the right bank, 350 feet high; abreast it the left bank has shoaled to nearly mid-channel, this shoal water extends for 2 miles of coast above, and beyond the bluff, after which the western shore is steep with deep water to Rosina rock.†

Between Hea-sanshan and Rocky point, 4 miles higher up, the eastern shore is reported rocky, and it is becoming very shallow on the western side of the two low islands above the latter, fully halfway across the river.

Rosina Rock is 70 yards off the point of the left bank in front of a small bluff on which stands a conspicuous watch-house, 10 miles above Sanshan, and close below Gros island, at the entrance of the May Queen channel. As this channel is now closed vessels which may be hugging the shore should sheer off on a S.S.W. course *before* the hill (150 feet) bears west.

Susquehanna Channel.—Gros (or Gras) island is 5 miles in length. Immediately above is Wade island, 8 miles in length, and the Susquehanna channel, which is west of the latter, should be entered between

* *See* Admiralty Chart of the Yangtse Kiang, Sheet 3, No. 2,678. Also, Route of the British Embassy, from Nanking to Poyang Lake, No. 1,402.

† The Navigating Officer of H.M.S. *Albatross* (1883), reports a rock with 6 feet (L.R.) lying about 400 yards from the shore, and ½ cable above the creek. Pheasant island lies east of Rosina rock. Pheasant island channel (between the island and the right bank of the river) is very rocky and not recommended.

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Wade, and May Queen, a small island formed south of Gros island, but great caution is requisite in entering, and Wade island must be closed within 200 feet on account of the highly dangerous shoal extending from the upper point of May Queen island, right across to the left bank and for more than 5 miles up mid-channel, continuing as a middle ground of 2 fathoms to within 3 miles of the upper end of Wade island. Great care is therefore required as this shoal narrows the channel (which at one part shoals to 3¼ fathoms L. W. S.) to 3 cables hereabouts. In ascending the river by this channel the Wade island shore should be kept close aboard until the Pagoda eastward of Lee island bears E. by S., when the helm should be promptly *ported* and a mid-channel course steered through the Pillars. Shoals extend a considerable distance from the upper end of Wade island; but these do not interfere with the channel, from which, through the Pillars, there is no difficulty.

WADE ISLAND LIGHT and BEACON is on the island about 4 miles from the northern end, it is a *fixed* light of the sixth order, dioptric, visible 7 miles, and exhibited from a black single pole surmounted by a painted wicker ball 70 feet high.

Susequehanna channel, which generally carries 5 to 7 fathoms, but not ess than 3¼ fathoms, is greatly to be preferred to the channel eastward of Wade island which is not so direct, and of which, in consequence of its being less used, there is never very recent information. Passing eastward of Wade island, deep water can be carried up the latter to Lee island, west of Tai-ping pagoda, then passing westward of Lee by a narrow channel between it and Jones island off the upper face of Wade island, the main stream is gained by the Gallows channel, at the south entrance of which is a bar of 12 feet over an intricate mass of shoals.*

THE PILLARS, 4 miles above Wade island, are two rugged, fortified eminences, 250 feet high, on either side the river, into which the eastern one projects considerably. The Tien-mun, as the passage between them is named, is deep and clear up to point Morton.

Point Morton, 3¾ miles above East Pillar on the same side, may be kept close aboard. Abreast it the channel, carrying only 4 fathoms, is greatly contracted by Dearborne, a flat island 2 miles in length, lying in the centre of the river. The flood waters of summer find their exit by Friends channel, a circuitous bend westward between this island and West Pillar, but this is generally found closed at its upper end in the winter season.

* According to the most recent information this channel is closed at its southern end.

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WUHU REACH.—When abreast the S. point of Dearborne I^{d} keep the summit of the 500 foot hill at Point Morton astern on a N. $\frac{3}{4}$ E. bearing until Wuhu beacon bears S.E. by E. to avoid the spit extending S. from Dearborne I^{d}, and then strike at once into mid channel to clear a very dangerous rock about a cable from the right bank, with shoal water outside it. The position of the rock, which uncovers 11 feet in winter, is indicated by Wuhu beacon and light, erected on the bank.

WUHU BEACON and LIGHT is on the east bank of the river, $3\frac{1}{2}$ miles above point Morton. It is a *fixed* light, visible 7 miles, exhibited from a black single pole surmounted by a painted wicker ball.

The other dangers in Wuhu reach are a rocky ledge $1\frac{1}{4}$ miles below Wuhu close to the right bank; a shoal off the fortress one cable off shore and parallel to the bank, and which dries in December; and a large triangular shoal of 6 feet water above and south of Wuhu, which extends from above the entrance of the creek to two-thirds across the river, with 2 fathoms on its western edge abreast the ruined fort.

WUHU,* Treaty Port, a walled city 52 miles above Nanking, is situated about $1\frac{1}{2}$ miles inland on the borders of a canal, and behind the hill on which stands a tall pagoda. The wall along the river side is distinct from the city, and the front of an enclosed camp, in which are six forts built on natural mounds, the approaches to which are defended by stockades and the rising ground thickly studded with pitfalls.† The country about Wuhu is destitute of trees. The canal is a clear stream of water falling into the Yangtse by the low pagoda south of the fortress.

Immediately abreast of Wuhu pagoda the stream sets in strong eddies, necessitating the greatest care on the part of the pilots, especially at night. Indeed the river from this to Lang-kiangki or Hen point, a distance of 90 miles, both from the strength of the current and the intricacy of the navigation at many parts, presents very considerable difficulties.

After passing the village of Su-kiang (when the 350 foot hill will bear E.S.E.), steer a mid-channel course S.W. by W. $\frac{1}{2}$ W. for $3\frac{1}{2}$ miles.‡ The Shansi bank, running out 3 cables from the shore of the left bank, is north-eastward of a range of hills 700 feet high. These mud banks can be followed by vessels of light draught when the water is at 38 feet, they

* The greatest rise of water at Wuhu is 25 feet from its lowest level, during very low water the down current is stopped by the flood tide, high water, full and change, 3h. 0m.

† It is stated that there is now no fort or military establishment. There is good anchorage in 6 fathoms off the hulks.—Navigating Officer, H.M.S. *Albatross*, 1883.

‡ Off Sukiang on the right bank is a shoal, and $1\frac{1}{2}$ miles above it on the same side is a small rocky island, above which far as the Sanshan ho the water has deepened.

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are 3 miles in lenght, and extend halfway across the river. After rounding Shansi point the north shore should be kept aboard, round Hains point 3 miles above. The north and east sides of Hains point have extended to mid-channel, and Haines bank now dries in parts when the water is at 28 feet; it is steep at the lower end. After passing the point the best water is found on the right bank as far as Yangkeatsun.

Sanshan creek is a cut-off of 2 miles, which may be taken in summer by vessels of light draught; it is stated to have 2 fathoms throughout the creek, and a bar of 10 feet at either entrance. The creek is 1½ to 2 cables wide, and on its banks are a few small villages. The lower entrance is north of the Sanshan hills.

Trade.—In 1880, the total foreign trade of Wuhu amounted to 1,157,496*l.*, the imports to 693,573*l.*, and the exports to 304,944*l.* In the same year the total number of vessels entered and cleared was 1,630 of 1,450,063 tons, of which 1,034 of 843,163 tons were British.

HAINS POINT, Beacon, and LIGHT.—A dioptric *fixed* light of the sixth order is exhibited from this point. It is elevated 36 feet above the bank, and in clear weather should be seen a distance of 7 miles.

KIEU-HIEN, or Kius-hien, is a town on the right bank of the river, 9 miles above Hains point and 3 miles northward of the Ta-wha-shan, a range about 1,500 feet high. There is good anchorage in 5 to 8 fathoms off the town. H.M.S. *Retribution*, of 20 feet draught, remained here during the first exploration of the Yangtse in 1858, and during her stay some useful information was obtained concerning the tides. To the northward of Kieu-hien is an extensive sheet of water named lake Chau-hu, or Chaou, which has two or three outlets on the left bank of the river, the principal of which is opposite Hains point.

Tides.*—From the 24th November 1858, the day the *Retribution* anchored off Kieu-hien, there was a daily rise and fall of 6 inches, but a steady decreasing of the level of the river until the 18th December, when the fall—since the 25th November—had amounted to 8½ feet. From the 18th December, when there commenced a week's constant fall of rain with fresh N.E. and easterly winds, the river rose gradually 3 or 4 feet and the vessel swung occasionally to a flood stream.† The flood having been sensibly felt off Nanking on the 29th December, and also very slightly off Tai-ping and Wahu, it appears that the influence of the tide is perceptible at a distance of 300 miles from the sea.

OSBORN REACH.—From Hains point a mid-channel course may be steered, passing Kieu-hien southward of Barker island, which is a

* William F. Hains, Master, R.N., H.M.S. *Retribution*, 1858.

† According to more recent observations the rise and fall in December is 6 inches.

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complete flat 6 miles in length. The Governor-General channel, north of Barker island, is supposed to be clear, but is not used. At the south-west point of Barker island is a shoal nearly one mile in extent, so that when passing it the right bank should be closed entering the next reach which runs to the southward. At the foot of the Ta-wha-shan range, the Pants-ki rock rises in a sheer mass from the eddying stream, surmounted by the gray mossy ruins of a temple and pagoda embowered among trees. The hills of the range here rise from the water's edge in grassy slopes partially wooded, with richly timbered valleys. The Ta-wha-shan range trends to the south-east for 20 miles, to where the Wild Boar hills overlook the river, but the river runs considerably to the westward of the intermediate part of the range.

A mile above the Pants-ki rock is the village of Teih-kiang, with its three-arched bridge of heavy masonry over a creek with a shoal off it, and its white but partially ruined houses clustering up the hill side or nestling among the trees at its base. A mile above the village the river abruptly leaves the range and takes a westerly direction along the Lauwan bend for 6 miles. Keep towards the right bank along the bend, the north shore of which is very shallow at the western part, until the northern. entrance of the Williamette channel is reached abreast Osborn island, when a vessel will be on a northerly course, passing Antelope point in mid-channel.

At 1½ miles above Antelope point the river again bends westward, and when the large village of Siau-shan-miau on the left bank opens, cross over, keeping the north bank aboard until after passing it, for the opposite shore is very shoal, and the channel along the bank very narrow. From this the course is along the left bank 9 miles up to the walled village of Chachau.

Williamette Channel, a cut-off of less than 2 miles, and which is used by steamers when the water is at 28 feet, has its entrance at Tsin-kia-chin, at the western part of the Lau-wan bend, where are some conspicuous trees, and a joss pole on the entrance point.* It is very serpentine with deep water round the bights and shallows off the points, and the western entrance is shoal and requires the aid of a pilot for its navigation.† Perkins point, its upper outlet, is sometimes shallow, and at other times steep-to. When, having passed out of this channel, the south extreme of Buckminster island (which ought to be closed) is nearly abeam, steer for the beacon on the N.W. point of Jeffry island, which can

* It is doubtful if these still remain.

† This channel curves considerably more to the northward than it did formerly, and near the northern end of it is an island, to the westward of which lies the course adopted by steamers.

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be passed close to, and its shore, and also that of the river when gained, kept up to Niangshan-ki.

Tungling-chis Channel, or Cosmopolite channel, is a cut-off of more than 3 miles, but has two bars at and within its eastern entrance, which is 1¾ miles above that of the Williamette channel. It is used by river steamers all the year round.

BUCKMINSTER ISLAND LIGHT AND BEACON is on the lower end of the island of that name, opposite the village of Tu-cheau. It is a dioptric, *fixed* light of the sixth order, exhibited from a black single pole surmounted by a wicker ball, elevated 48 feet above the bank, and in clear weather should be seen from a distance of 7 miles.

WILD BOAR REACH takes a course nearly south for 15 miles above Buckminster light. There is high land on the left bank of this reach, the first rising ground met with on this side the river after passing the Pillars, a distance of 50 miles. Buckminster island is 6 miles in length, and south of it is Jeffry island which lies eastward of a spit, nearly 2 miles in length, extending southward of the former. Buckminster passage is the eastern channel of the river and is deep, but much narrowed between Jeffry island and the spit; it must be used if proceeding by the Williamette channel, the western entrance of which is 3 miles below Jeffry island.

The principal channel is west of Buckminster island, the north point of which is passed nearly mid-channel. About 2 miles northward is the village of Chachau or Tucheau on the left bank half a mile from the river, and surrounded by a white wall, but ruins extend from the wall to the water's edge. Off Chinte-chau, the northern part of Buckminster island, a spit runs out for ¾ of a mile, and a shoal, off the left bank above the village. The reach is quite clear and nearly South for the next 10 miles. Four miles above Jeffry island stands a conspicuous bluff, 100 feet high, overhanging the stream, on the wooded summit of which is the ruined temple of Kiangshan-ki, in passing which be very careful of the helm on account of the current; close it somewhat and also the flat island of Tatung lying between two channels leading to the town of that name. Having passed the second channel, edge over to the left bank on a S.W. by W. course between extensive shoals on both sides of the river, avoiding the spit which runs out for 1¼ miles S.W. from Thompson island, is steep-to and dries at low-water. The remarkable forked tree on the north bank is scarcely noticeable when going up till nearly abreast it, though conspicuous from above; for 5 miles above it to within one mile of Fitzroy island the course is mid-channel.

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FITZROY ISLAND, BEACON, and LIGHT is on the lower end of the island. It is a *fixed* light of the sixth order, dioptric, exhibited from a Black single pole surmounted by a wicker ball, elevated 38 feet above the bank, and should be seen in clear weather a distance of 7 miles.

Here there were formerly three channels, of these the northern channel along the left bank north of Fitzroy island is the only one remaining, the other two having become closed. Banks are liable to form suddenly about these islands; in the spring of 1866, one formed eastward of Fitzroy, having only 4 feet over it and one mile in extent.

On approaching Fitzroy island close the left bank and follow it round till nearly up to the creek* opposite the south point of the island, when steer up S.W. for a remarkable tree of somewhat conical form on the right bank; the river again becomes clear above low island, and when Chichau pagoda bears E. ½ S. the banks extending westward of that island will be passed, a mid-channel course may be steered for the next 4 miles, to where the river begins to widen out to a considerable breadth just above a small rise of 70 feet on the north bank, and opposite which is a small low island with a shoal extending from it in line with the river bank, for 1½ miles above Tai-tzu chi, a conspicuous rocky island 30 feet high, which appears to lie almost in the middle of the river and cannot be mistaken.

Dangers.—On the north bank abreast the low island above mentioned and S.E. of a large tree are a patch of rocks, 50 yards off shore at high water, and about 1½ miles above the 70-feet rise, is a small tributary of the Yangtse, on passing which steer to pass within a cable westward of Tai-tzu chi, to avoid a dangerous shoal (dry in December) which fronts the west shore and bight of the river for an extent of 3 miles, and the edge of which is in mid-channel.

TAI-TZŬ CHI LIGHT and BEACON, is a *fixed* light of the 6th order, dioptric, elevated 15 feet above the summit of the rocky islet; in clear weather it should be seen 7 miles. It is exhibited from a black single pole surmounted by a wicker ball.

Between Tai-tzu chi rock, and the bend of the river 1½ miles above, a mid-channel course must be steered (S.W.) for nearly 2 miles, great care being taken not to bring the *rock* to the northward of a N.E. ¾ E., bearing (astern) to clear both the 2-fathom bank and the bed of rocks extending from the south bank, when the joss-house with 2 poles on the left bank

* Remarks of Archibald T. Miller, Master, R.N., H.M.S. *Slaney*, 1866.

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bears *south*, starboard helm may be given and the wreck light boat steered for. The rocks near Observation spot are 150 yards from the shore at high water, and dry at 14 feet, the sandbank is very steep and dries at 20 feet.

LANG-KIANG-KI* or **Hen point,** 100 feet high, is a mile above where the river bends back to the north-east; this part is rendered excessively dangerous by a large barrier of rocks extending from the point half way across towards the west bank of the river, the tops of which rise out of it like so many stepping stones. In December the outer rock of this barrier is dry, but may be seen a month earlier marked by a bush which is sunk on it. Mr. Hockly also states that there is a spit just above a low point nearly opposite Lang-kiang-ki. To avoid this dangerous spot the Chinese have made a cutting or canal on the eastern bank called the No-yang ho. This channel dries across the southern part when water is at 14 feet, and is used by junks.

In rounding Hen point there are very strong eddies, and great care is necessary with the steerage in passing through the chow-chow water, which has been known to nearly turn a large vessel round and run her ashore before the helm could take effect. The eddies are strongest at the upper part of the passage about abreast the rocks. Keep the left bank aboard, and when past the rocks, or when Hen point bears East, make good a S.E. course across to the opposite or left bank of the river which is steep, and should be kept aboard on a nearly S. by W. course for the next 3 miles to the sandstone cliffs.

KIANG-LOONG ROCK.—A very dangerous sunken rock, over which was a depth of 15 feet† on March 9th 1873, exists right in the fair-way, a little below Hen point. From the rock, Hen point bears E.S.E., Tai-tzu chi islet N.N.E. $\frac{3}{4}$ E., and the lighthouse S.S.W. By keeping Tai-tzu chi well open of the point until the lighthouse bears S. by W., the rock will be avoided. This rock, which is probably the outer danger of the ledge off Hen point is well westward of the centre of the river.

Kiangloong Wreck Light.—Off Hen point is a *fixed* white light visible 7 miles. Exhibited from a light boat. The *wreck* bears N. 68° W. from Hen point, and S. 35° W. from Tai-tzu chi joss-house. The light boat is moored abreast of the wreck and on the left bank of the river to mark the starboard side of the channel for vessels entering from seaward. It should be passed close to in order to avoid the wreck. The Kiang Loong wreck is awash at low water and dried in 1880 when the

* Meaning "Bar river hen."

† The least water reported on the rock is 9 feet.

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water was 3 feet at Ku Kiang. Great care is required by reason of the strong eddies when passing this position. The rocks extend off Lang-kyang-ki as far as the wreck at low water, they begin to dry when water is at 20 feet.

NGANKING REACH.—Opposite the lower end of some sandstone cliffs nearly 4 miles above Hen point, Nganking reach is entered by the channel north of Jocelyn island, which carries 3½ fathoms. The channel south of Jocelyn island, 5 miles in length, and which is bordered by shoals, has not been used since 1871. From the cliffs for the next 12 miles the northern shore (left bank) should be kept aboard until Eagle island beacon bears South, when, cross over to the Eagle island shore, taking care to avoid the spit which runs out from its northern end for over ½ a mile.

Nganking, the capital of Nganhwui, is an extensive walled city standing upon the left bank, upon ground considerably raised above the surrounding country. There is a substantially built, isolated stone fort on the low ground of the bank just below the city, in which is a fine pagoda. The river face or south side of the walls is fully 1½ miles long. Extensive suburbs, which once existed, are now in ruins.

EAGLE ISLAND LIGHT and BEACON is on the lower end of Eagle island. It is a *fixed* light, of the sixth order, dioptric, elevated 34 feet above the bank, and is exhibited from a black single pole surmounted by a wicker ball, and in clear weather should be seen a distance of 7 miles.

Opposite Eagle island light is Sandy point, 4 miles above Nganking. There is a very conspicuous tree inside or westward of the point which is a good guide to a stranger, as it can be seen almost immediately after passing Nganking, for the land is extremely low and bare. Sandy point has a spit which must be approached with much caution as it is extending eastward; a S.S.W. course from the two small trees above Nganking will clear it. Eagle island is washing away. The inside channel is sometimes used by steamers at high water. The soundings were taken when the water was 30 feet at Kuikiang in 1879. The spit off the beacon is very steep.

CHRISTMAS ISLAND; BEACON and LIGHT.—Immediately above Eagle island the river divides round Christmas island, 4½ miles in length, and the most direct course is eastward of this island. In taking this channel keep the right bank aboard, avoiding the north-east

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point of the island, but closing the south-eastern part after passing the Red sand bluffs.*

Abreast the south-east part of Christmas island and south of the Red sand bluffs, a low island, a little over a mile long, has formed on a shoal 3½ miles long by 1½ broad that greatly contracts the channel, which at this spot lies close to Christmas island.

The Light is on the south extreme of Christmas island; it is a *fixed* dioptric light of the sixth order, elevated 38 feet above the bank, is exhibited from a black single pole surmounted by a wicker ball, and in clear weather should be seen a distance of 7 miles.

Christmas Cut-off is a narrow passage eastward of Low island, and may be used for light draught steamers when the water is 18 feet. Low island bank begins to dry at 24 feet.

The roundabout channel westward of Christmas island is never taken, and little is known concerning its present state.† It was formerly a deep channel with the course nearly west from Sandy point till after rounding Rover island, when it was again to the southward, gradually approaching Christmas island, the southern point of which was to be passed about 1½ cables, to avoid some mud flats lying near the left bank, which did not dry till December. Rover island was also passable on the east by a 6 fathoms channel.

TUNGLIU REACH.—Stand into Tungliu reach with the west extreme of Christmas island bearing N. by W. ½ W., which is a mid-channel course, borrowing over to the Red bluffs of Whangshih-ki, 3½ miles above, and gradually gaining the right bank, which may be followed up to Tungliu. Above Christmas island there are flats on both sides, but above the bluffs the deep water is along the east bank, and nearly the whole reach is filled with a succession of middle grounds, westward of which is a channel which is not used by heavy draught ships, but which light draught steamers can follow when the water is at 30 feet.

Tungliu,‡ a third-class city, with rather formidable looking walls, built on the right bank, stands a little back from the river, from which it is separated by a plain half a mile broad. The wall dips and rises over undulating ground, and finally descends to the waters of a lake which half encircles the town, and is fringed with trees. The surrounding country produces wheat, millet, rice, cotton, hemp, potatoes, and inferior tea. A

* There is always deep water in the channel.

† This is really the main channel of the river.

‡ *See* Admiralty Chart of the Yangtse kiang, Sheet 4, Tungliu to Hankau, No. 2,695; scale, $m = 0{\cdot}5$ of an inch.

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pagoda of eight stories stands on a point of the river north of the town. Give this point a good berth, as, although shallow water was not obtained there, a great commotion was observed in the stream, apparently caused by some rock or other check to its even course.

After passing the pagoda, continue throughout the reach along the right bank, thereby avoiding an upper series of middle grounds, dry in December, which extend from the brick kilns on the left bank for 7 miles above Tungliu. These dangerous banks will have been passed when the 2 trees below McQueen's rock bear eastward of south.

CAUTION.—The greatest care is necessary when navigating all that part of the river lying between Tungliu and Whangyuen-chin (where there is a custom house with joss poles), for the rocks are numerous along the *right* bank. The rocks off the point 2 miles S.W. of Tungliu reduce the channel at that spot to two cables. Rocky point (2 miles further on) dries at 100 yards off shore, with the water at 27 feet. From Spencer rock to the creek opposite Whangyuen-chin, a bank studded with rocks extends for more than 150 yards off shore, the chief of these, *McQueen's rock*, dries at 8 feet. Between Whangyuen-chin and Dove point at the upper extremity of this reach, which is 26 miles above Christmas island, and northward of the Whangyuen creek for 3 miles (to below the brick kilns) a large shoal has formed, which at its central part abreast the creek extends for ½ a mile from the shore, but the point itself is steep; the right bank must therefore be kept throughout the reach.

Spencer Rock and Light.—The rock which is about 5½ miles above Tungliu, about 100 yards from the *right* bank, has 6 feet water on it when the water is zero at Kiukiang. A ship's light visible 2 miles is exhibited from a floating frame, but is only in position at very low water.

On the right bank of the river here are high ranges, but the left is quite a flat, and although the river banks are, in November and December, 25 to 30 feet high, the country shows evident signs of being frequently inundated; sampans are found at most of the farm-houses as far inland as 3 or 4 miles, affording a very significant hint as to the state of the country when the river is at its high level. It must be borne in mind that the whole of the left bank and large portions of the right would then be covered, the river becoming a large lake, and under these circumstances it is advisable as a rule to keep in the most rapid part of the current, *for it always runs strongest in the deep water.*

DOVE POINT LIGHT and BEACON is a *fixed* dioptric light of the sixth order, elevated 34 feet above the bank, and in clear weather should be seen a distance of 7 miles. It is exhibited from a black single pole surmounted by a wicker ball.

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BULLOCK REACH.—At Dove point, off which are strong eddies, the river takes a sudden turn at right angles to its former direction, the course being about N.W. for a short distance, and afterwards gradually changing till it becomes S.S.W., from which it varies little for the next 10 miles. The left bank must be kept throughout the reach, first to avoid a shoal formed south of Dove point on the opposite shore, which has greatly narrowed the channel, and subsequently to pass clear of the extensive sandbanks off the islands (Dove and Pigeon islands), to the northward of which the river bends above Dove point.

Matung Cut-off, which is taken in summer when there is a good depth of water, and by which 3 miles may be saved, is considered extremely unsafe; it is entered by passing Dove point on a westerly course; its course is south-westward. But in summer the right bank may be kept altogether, passing inside False island, which lies eastward of Dove and Pigeon islands. In this channel the least water then obtained is $2\frac{3}{4}$ fathoms.

Little Orphan.—At 13 miles above Dove point, near the southern termination of Bullock reach, is the Siau-ku shan or Little Orphan, a remarkable rock, rising almost perpendicularly out of the river to the height of nearly 300 feet. It has some joss houses on its summit, and half way up its southern face is a Buddhist temple. In December the base of the rock is connected with the left bank by mud.

Immediately opposite the Little Orphan, at the foot of the broken range called King-tse-shan, or "the mirror mountain," a bold rocky head, crowned by forts and look-out houses, rises abruptly to a height of 100 feet; and 2 miles above, where the hills of the right bank again come down to the water's edge in rocky promontories, is the fortified town of Pang-tsis hien. A centre course may be steered in passing the Little Orphan (off which a bank extends for 1 cable there being 8 fathoms in mid-channel), until Pang-tsis hien is passed, when the channel lies close to the shore south of three conspicuous hills which come down to the water side. A mile above Remark rock, and 3 miles above Pang-tsis hien, a wide creek opens on the right bank, before arriving at which alter course to W.N.W., crossing over and gaining the left bank on entering Blackney reach. At the turning point of the river opposite the three hills a sand bank, which dries 26 feet, runs out 4 cables from the shore.

BLAKENEY REACH.—Keep the north bank aboard until within $\frac{3}{4}$ of a mile of N.E. Beacon, when gradually haul round to the S.W., steering between the extensive banks, which at this part narrow the channel to less than $\frac{1}{2}$ a mile, on a S.W. by W. $\frac{1}{2}$ W. course, until the

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large tree north of the village of Chang-Kiakaw bears N.W., after which a mid-channel course S.W. will lead clear to point Becher.

N.E. CROSSING LIGHT and BEACON, on the earth bank, 3¾ miles above the creek at the entrance of Blackney reach, and 11 miles below point Becher, is a *fixed* light, elevated 38 feet above the bank; in clear weather it should be seen from a distance of 7 miles. It is exhibited from a black single pole, with wicker ball. In January 1883 this light was moved about 1 mile down the river from its former position.

POINT OTTER (Lay island) LIGHT and BEACON.—On the eastern extremity of Lay island, at the junction at the head of this reach, is a *fixed* light, of the sixth order, dioptric, shown from a black single pole surmounted by a wicker ball. It is elevated 36 feet above the bank, and in clear weather should be seen from a distance of 7 miles.

POYANG JUNCTION.—At the head of Blackney reach the Yangtse receives the tributary waters of the Kan kiang, which discharges itself through the Poyang lake, the entrance of which is 2 miles above the junction. To a stranger the Kan kiang, which is a direct continuation of Blackney reach, would appear to be the main stream, into which the Yangtse falls by three channels almost at right angles to its lower course, opposite a village standing at the foot of the sand-fronted range on the right bank. The description of the Yangtse is continued at Oliphant island, on page 485.

POYANG LAKE.—The lower part of this extensive sheet of water is only 2 miles above the junction to the south-west, where on its eastern shore stands the city of Hukau (Lake Mouth), upon the summit of the steep cliffs of Tsa-chi or the "Jagged head"; this city is only a military post. The lake is some 50 miles in length, and its northern part, is narrow for the first 24 miles, (from 4 to 6 miles in breadth,) and very shallow in the winter season, and there was scarcely 6 feet in April 1861, except in the bed of the Kan kiang, which winds through it, and is deep; but between this and July the water rose 21 feet, which rendered the navigation of the lake at that season easy for any class of vessels.*

There are many beautiful and populous islands on the lake, and its fisheries are said to be important. Besides the Kan kiang, the Fu and numerous other streams fall into the lake from the rich black tea districts to the westward; and, what under existing circumstances is more impor-

* *See* Sketch of Poyang Lake and Kan river to Nanchang:—scale, $m=0{\cdot}5$ of an inch, on Admiralty Chart of Yangtse kiang, Sheet V., No. 2,849; a recent survey by Commander R. Pitman, R.N., H.M.S. *Ringdove*, October 1878, to the river level of which date the soundings are reduced. *See* levels on pages 485, 488, 489, 500, 501.

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tant than all, the rivers flowing from the eastward are connected by canals with the streams traversing Fychow, Moyune, and the whole of the green tea districts, which are thus as accessible from this lake as from Suchau and Shanghai. It is, in short, the centre of a most extensive and important network of river and canal communication, brought into a very high state of perfection by the Chinese in more prosperous times.* The chief commercial city, Wuchau or Wuchin or Wu-hung, stands on the western side of the lake, 27 miles above Hu-kau, at the foot of the lofty and precipitous range of the Liushan, or Mule mountain, 4,000 feet in height, and is said to exhibit every sign of prosperity.

The town of Ta-ku-tang,† 8 miles above the junction and 2 miles above Ta-ku-shan, the Great Orphan rock, is the lowest place on the lake which affords good anchorage. Here large numbers of junks laden with produce from the country anchor, and although it is 23 miles by water from Kiukiang it is but 11 miles by land, and a good road has been constructed between the two places by which merchandize frequently proceeds, as it can reach Kiukiang by this means in as many hours as weeks are sometimes required by the junks to accomplish the journey in summer. For some 30 miles from its entrance the Poyang has the appearance of a river rather than a lake, in some places being only a few hundred yards in width, and in no place more than a mile, beyond which it expands to an average breadth of 15 miles, though only a narrow channel is practicable for deeply-laden vessels, the remainder being extremely shallow and quite dry during the winter. Promontories of land, facing each other, divide the lakes into three distinct sections joined by narrow channels of communication. On the northermost of these divisions is situated the large prefectural city of Nan-kang-fu, which, although destitute of natural advantages constituting a harbour, nevertheless affords a safe anchorage for junks, by means of a strong breakwater of granite, which gives shelter against the southerly winds sweeping across the lake just at the period when the waters are the highest. Near this place is the important Commercial town of Wu-cheng, built upon a hilly island formed at the junction of the two principal streams falling into this portion of the lake, and one of which is the highway from the provincial capital of Nan-chang fu to the Yangtse.

Although the privilege of navigating the lake in steam vessels is denied to foreigners, the numerous important centres of trade have been visited by them in native boats, and King-te-chen, the principal seat of the

* Report of Shanghai Chamber of Commerce, 30th March 1861, a deputation from which accompanied the expedition under Vice-Admiral Sir James Hope, K.C.B.

† Abridged from a description by J. L. Hammond of the Chinese Customs.

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celebrated porcelain manufacture, is one of the few interior places where they have been rudely treated.

The KAN KIANG, the mouth of which, on the northern borders of Kiangsi, is 430 miles from the sea, and 240 above Nanking, is the lowest of the great tributaries received by the Yangtse. It runs centrally through, and with its smaller affluents drains the whole province. It is navigable almost its entire length of 300 miles, to Nan-ngan, which is 150 miles north of Canton, to and from which goods are carried across the mountains through the Meling pass. Large boats are obliged to stop at Kanchu a place of great trade 50 miles lower down; and some 20 miles below this are the Shih-pah-tan, or eighteen rapids, which are formed by ledges of rock running across the river, but not seriously obstructing the navigation, except when the river is low. Nan-chang, the provincial capital, is above the lake, its walls accessible on all sides by water. It is said to be a place of not much importance at the present time, but Barrow estimated the shipping there, in his day, at 100,000 tons. Two other large cities, Lin-kiang and Kih-ngan, are respectively 50 and 100 miles above Nan-chang.

Productions.—The productions of this province, which is very populous, are great in amount and variety. Large quantities of rice, wheat, silk, cotton, indigo, tea, and sugar are grown and exported. It excels in the quality of its porcelain, a vast manufacture of which was carried on at Kingte-chen, about 45 miles north-east of Jau-chau at the head of the Poyang lake, where a million workmen were employed, and 500 kilns kept constantly burning. In the Yuling or Bohea mountains in the south-east are produced camphor, varnish, oak, banian, fir, and other trees.*

Coal is said to be found at two places, viz., Yuen-chau on the Yu ho, a tributary of the Kan in the western part of the province, and at Loping, on a stream on the eastern side of the lake about 50 miles from its head. There are two descriptions of it, called "red fire coal," supposed to be an anthracite, and "green fire coal;" the latter, a better quality (probably bituminous) than was procurable at Hankow, being obtained for H.M. gunboat *Havoc* at 6 dollars a ton.†

BARS above Poyang Junction.—There exist at three parts of the river between Poyang junction and Hankow, during the winter months, bars, which are constant, although they vary somewhat in depth from year to year. Their positions are:—north of Oliphant island;‡

* Williams' *Middle Kingdom.*

† Blakiston's *Yangtse*, p. 343.

‡ In February 1873, at Oliphant island bar. The current ran 3 to 4 knots.—*Lieut. Whish, R.N.*

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above Hunter island, also called Red cliff bar; and north of Gravener island. Hunter island bar has the least water, and in some winters only 8 feet over it; Gravener has generally 5 feet greater depth, and Oliphant island bar varies from 8 to 12 feet. *See* also article on the levels at Kiu-kiang, page 488.

Depths in the Bar Channels.—The depths over the bars and in the channels about Oliphant island may be computed approximately for any given day, if the depth on any other day, a short time previous, can be ascertained, by making a correction according to the rise or fall of the river in the interval, as follows:—

The river falls.		The river rises.	
From Oct. 15 to 31	3 in. per day.	From Feb. 8 to 14	½ in. per day.
„ Nov. 1 to 15	5 „ „	„ „ 14 to 28	4 „ „
„ „ 15 to 30	6 „ „	„ Mar. 1 to 15	3 „ „
„ Dec. 1 to 15	4 „ „	„ „ 15 to 31	2½ „ „
„ „ 15 to 31	3 „ „	In May and June the river rises with great fluctuations.	
„ Jan. 1 to 15	2 „ „		
„ „ 15 to 31	1 „ „		

OLIPHANT ISLAND, 10 miles in length, lying westward of point Becher, and Lay island 5¼ miles in length, south of it, here divide the river into three channels, all of which are shallow at some part of their course, the least water in each, viz., in the North, Direct or Middle, and South channels being (in December 1858, when the river was at its lowest level) 13, 11, and 4 feet respectively.* The greatest volume of water is through the North or main channel of the river; the Direct channel is narrow, with a bar at its eastern entrance; the South channel is still narrower, and as yet unexplored.

All these channels are ascended on westerly courses, but the North channel makes a broad bend to the north-westward at right angles to its direct course, at its junction with the mass of water pouring out of the Poyang lake, which its swift current actually opposes. Eddies and whirls are formed from this cause at Becher, Oliphant and Otter points, which make the navigation somewhat intricate and difficult, necessitating caution to avoid the shoals at various parts of this junction, and which are probably shifting, and a sharp helm in passing through the chow-chow water. It is almost impossible for a river to have assumed a more deplorable natural condition than the Yangtse at this point. Point Otter light is described at page 482.

* From the observations of Commander T. M. Maquay, R.N., H.M.S. *Ringdove*, 1870–71.

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NORTH CHANNEL.—The western part of Oliphant point must be hugged, and the left bank of the river, which is generally clear, kept throughout the channel. The current is very rapid. The whole north side of Oliphant is bordered by extensive shoals; a spit 1½ miles in length also extends up the river, mid-channel, from the west point of the island, and some care is required in passing between it and a shelf off the left bank above, after clearing which keep the south shore aboard up to Kiukiang.*

DIRECT CHANNEL has shoals at its eastern entrance, which at times form a wide bar, composed of hard sand, over which the least water recorded has been 7½ feet.

No precise directions can be given concerning this channel, the soundings being the only guide. It was closed in 1880 during the very low water. Local knowledge is absolutely necessary.

At the western entrance of Direct channel some rocks (Kiukiang rocks) extend from under the red cliffs on the south side, and the bank dries to 300 yards beyond these.

From Wusung to Becher Point the directions and chart should form a sufficient guide for the navigation of the Upper Yangtze.

Beyond this point too much reliance must not be placed on either.

The Oliphant channels are subject to such continual changes that it is undesirable to give any fuller description of them. The latest information should be obtained from the river pilots, whose services are generally indispensable, and it may also be necessary to buoy the passages.

Lay Island Beacon.—On the Upper (West) end of Lay island consists of a pole painted *black* and *white*, and surmounted by a black ball 3 feet in diameter, placed to mark the channel during the low state of water in winter.

Kiukiang Rocks LIGHT on the south bank is exhibited from a single pole 12 feet above the position on which it stands, and in clear weather should be seen 2 miles. It is a *fixed* light, showing *red* towards the rocks and *white* when approaching from above or below.†

KIUKIANG Treaty Port, the second treaty port on the Yangtse, stands on the right bank of the river, 14 miles above the outlet of the Poyang lake, and 6 miles from its borders. It is 452 miles from

* In taking the North Channel in February (1880) the least water was 13 feet which depth was carried about 1½ miles, I think more water could have been found, as the Pilot in charge was going only by the soundings.—Remarks of Lieut. Carey, Commanding H.M.S. *Moorhen*, 1880.

† Chinese official light list, 1884

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Shanghai, and 134 below Hankow. It was opened in 1861, having been selected on account of its proximity to the channels of inland navigation, especially those conducting to the green tea districts of Kiang-si and Ngan-whei, and has always been a port of some consequence.

Kiukiang* is a prefectural city of the province of Kiang-si. Its walls, 5 miles in circuit, are built close to the river and enclose the government offices, some temples, and a large extent of vacant ground. Its principal street runs east and west and also traverses the large suburb on its western side, above which is the British concession extending about 500 yards, parallel to the river, as far as the Lung-kai ho canal which communicates with the lake which surrounds the city on that side. The British consulate occupies a central position on the bund.

Supplies, Climate, &c.—The foreign community is small, and includes a consul, a chaplain, a physician, and the employés of the Chinese maritime customs. Provisions are of the class and about the same in price as at Shanghai. Coal can be procured from a firm, or from the agent of the Shanghai Steam Navigation Company. In climate Kiukiang is considered well favoured, and although the months of July and September are hot, and the temperature in August frequently rises to 100°, the heat is not of that damp, enervating description that prevails on the coast, and is therefore far less oppressive. During the winter months continuous and bracing cold weather is experienced, with snow and frost in January and February.

Trade.—The failure in realizing the prospects of Kiukiang as regards trade is mainly attributable to the port being above, instead of below, the navigable outlet of the Poyang lake and its tributaries. The 15 miles of ascent against a rapid current, which have to be achieved by native cargo boats before arriving at Kiukiang from the Poyang junction, constitute a serious obstacle to the concentration of exports at this place. The immediate neighbourhood of Kiukiang has no commerce, and it is only on the Poyang that an extension of foreign trade is to be looked for. A certain quantity of tea is, however, annually brought to Kiukiang despite existing difficulties, and forms the chief article of foreign export, the remaining articles of merchandize being coarse chinaware, paper, hemp, coal, etc. shipped to Shanghai for the coast trade. The total trade of the port amounted in value in 1882 to 3,373,550*l.* sterling. The total number of vessels which entered and cleared was 1,158, of which 1,094 were British.†

ANCHORAGE.—One of the main defects of the port is the want of a safe and commodious anchorage, for this part of the river is deep and

* Abridged from *Treaty Ports of China*, p. 429.

† Commercial reports of H.M. Consuls in China, 1882.

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rapid, and strong north-easterly winds cause much sea. The best position is just above the settlement, in 5 to 10 fathoms according to the season, close to the bund near the canal. The bottom is loose, coarse gravel, and very bad holding ground, and vessels not unfrequently drive with two anchors down.

Buoys are moored off the Concession for all the river steamers, which may be used by men-of-war if not actually occupied. The Lung-hai ho canal has been found advantageous, as it affords a refuge for native boats in storms during summer. During heavy rains the large volume of water rushing out of this creek forms a strong eddy.

Wrecks.—Three hulks are moored off Kiukiang and two wrecks lie off the settlement. The "Huquang" is visible at low water. It dries 6 feet. Off the creek is bad anchorage, the best at high water is below the hulks clear of the Huquang wreck.

Esbem Snare Wreck and LIGHT.—Off the centre of the bund a floating frame is moored over the wreck, from which is shown, during a low state of the river *only*, a *red* ship's light is visible two miles.

RISE and FALL of the RIVER.—In summer the river at Kiukiang rises about 34 feet above its winter level; in 1870, a year of unusual inundation, it rose 40 feet, and the rates of subsidence and rise were as follows:—

Fall of river.		Rise of river.	
To end of September	5 feet.	7th to 28th February	5 feet.
During October	7 „	During March	10½ „
„ November	8½ „	„ April	say 10 „
„ January	3 „	„ May	say 7 „
February 1st to 6th	4 inches.	„ June	say 4 „

The rise in the three last months is computed from former observations. In one year it is recorded that the rise did not attain its lowest level till March 11th, after which it rose 20 feet in a single month. The winter levels vary about 3 feet, but in those years in which the level stands higher it by no means follows that there is a greater depth in the channels of the river, for by observations made in 1870 and 1871 the winter level was higher than that of the four previous years, and 2½ and 3 feet higher than in 1868, notwithstanding which greater difficulties were experienced in getting up to Hankow, and the depth of water obtained was less. The closing of the channels in years of exceptionally great inundation may be therefore expected, and may be accounted for by the larger amount of alluvial matter then brought down, being deposited in the bed of the river when the stream loses its force. Observations made in 1870 and 1871

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offer confirmatory evidence, for it was ascertained that the bed of the river rose during the subsidence of the waters.

The following is the record of rise and fall of tides between the years 1870 and 1880:—

Low water.		High water.
August 15th - 44 feet 6 inches.	1870	
July 3rd - 43 „ 9 „	1871	January 28th - 4 feet 8 inches.
August 1st - 38 „ 8 „	1872	March 5th - 1 „ 8 „
August 3rd - 31 „ 0 „	1873	January 28th - 1 „ 10 „
July 2nd - 41 „ 9 „	1874	February 10th - 4 „ 7 „
July 10th - 39 „ 10 „	1875	January 29th - 3 „ 1 „
July 3rd - 42 „ 7 „	1876	February 5th - 4 „ 0 „
September 27th 34 „ 10 „	1877	January 30th - 3 „ 2 „
August 14th - 43 „ 6 „	1878	January 31st - 5 „ 1 „
July 11th - 38 „ 2 „	1879	February 24th - 4 „ 1 „
	1880	January 18th - 1 „ 10 „

The Current.—The current runs 1 to 2 knots in winter and to about 5 knots in summer. It is accelerated by strong winds.

SEYMOUR REACH.—Immediately above Kiukiang the left bank of Seymour reach, nearly as far as Hunter island, has shoaled extensively. A bank has formed abreast 9 mile creek, which dries at 27 feet, and is said to be altering fast, while from 3 miles eastward of the same creek a long, narrow tongue projects, carrying from 1 to 2 fathoms water, narrowing the passage opposite the Custom house, and for 2 miles westward to 2 cables. The course lies along the right bank to Tree point; from thence gradually closing the north shore to the south point of Hunter island.

HUNTER ISLAND LIGHT (Light Boat No. 4), a stake lantern shown from a mast with ball 32 feet high, should be seen in clear weather 7 miles. The boat is moored off the upper end of Hunter (or Huang-lin) island except from July 1st to December 31st, when she is shifted to Collinson island (*see* page 492).

COURT REACH.—Hunter Island and Bars.—The river splits at Hunter island, 17 miles above Kiukiang, making a sharp, deep-water bend north-eastward round the island, which is 3 miles in extent. The north channel does not appear to have been used since 1877 when there was a bar of 6 feet N.E. of the island. Above the island is a mass of irregular, shifting shoals extending for some 6 miles westward.

Red Cliff Bar is abreast some very conspicuous red cliffs on the right bank of the river. This bar is very shoal, and in 1880 is reported as

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having only 4 feet over it. Of the south channel Lieutenant Carey (commanding H.M.S. *Moorhen*), writing in 1880, thus speaks :—"On the 9th "of February the *Moorhen* passed through the channel, close to the red "cliffs; this passage was buoyed by the ship's boats; the least water "obtained was 11 feet, the average depths being 14 feet; the best water "was off the south bank of the river, at about 200 yards distance until "closing the red cliffs, when 3 fathoms was obtained, increasing to 6 "fathoms, closing the shore as the water deepened. I should recommend "no vessel taking this channel until first buoyed when the water is low at "this time of the year." It was first used in 1877 when there was 10 feet at low water; 11 feet in 1878, 10 feet in 1879, and 8 feet in 1880. A patch of 6 feet *hard bottom* is said to lie on the north side of east entry. After passing Hunter island keep along the red cliffs, and when arriving near the upper part of them cross the river carefully, feeling with the lead.

After passing the village of Makau the south shore must be kept aboard until within ½ a mile of Wang-lin-chow beacon, when, cross the river on a N.W. by W. course, for the village and creek opposite Futse-kau. Banks stretch out from the northern shore all along this portion of the reach. Eight miles above Hunter island the town of Wuhiutsun or Wusueh is passed, where there appears to be a flourishing trade in timber.

Futse-kau Shallows.—The bight of the river where Futse-kau is situated is for 3 miles filled with shallows, and the channel has narrowed considerably by the growth of the banks on both sides. The left bank has most water after passing the creek opposite Futse-kau and for 3 miles beyond, after which, steer a mid-channel course until the creek south of Havoc rocks is reached. A small river enters the Yangtse at Futse-kau, and leads to a district of which coal and cotton are the two most important productions. This coal was (in 1874) said to be procured at Hing-kwoh, 15 miles up this stream, at the price of 18*s.* a ton.

WANG-LIN-CHOW and LOW POINT LIGHTS.

Wang-lin-chow Light, on the eastern end of the island of that name, is exhibited from a tripod beacon with ball 60 feet high. It is visible for 7 miles from N. 85° E. round by S. and W. to N. 35° W.

Low Point Light, also exhibited from a single pole with ball, is *red*, and visible 3 miles, from S.E. round by S. and W. to N. 15° E. It is on the low point 3 miles N. of Split hill, on the right bank of the river.

KICHAU REACH is entered at Pwanpien shan or the Split hill, 3 miles above Futse-kau. The river here becomes contracted, flowing through a hilly country, but the water is deep and the navigation easy except at the Havoc rocks and when approaching Kichau. In the summer season, between Futse-kau and Havoc rocks, great attention must be paid

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to the helm, for the channel is narrow with steep bluffs on both sides, and the current being thrown off by the points causes strong eddies, and in some parts runs from 5 to 7 knots an hour.

Havoc and other Rocks.—There is a point on the east side, 2 miles above Split hill, on which is a ruin, and off this point are some rocks. Havoc rocks are 4 miles above this, and lie off the left bank in a bight between two low hills; to avoid these vessels should keep in 5 or 6 fathoms water abreast them, in mid-channel, is a rock which was uncovered 3 feet in February 1865.* Rocks also border the shore in front of a village on the right bank, 2 miles above Havoc rocks, and a bank extends from the opposite shore, keep mid-channel here.

From the point above this village, and on which are two small hills, to a mile above Kichau the mud flats lying off the right bank have increased to such an extent as to render the channel dangerously narrow during the winter months; and to clear them, an isolated rock, on which stands a remarkable ruined fort, with a tripod *red* beacon surmounted by a ball; must be steered for, passing outside or westward of it within 100 yards, and the shore at Kichau at the same distance. These mud flats extend some 4 miles parallel to the bank.

KICHAU LIGHT, on the ruins of the old fort on the islet in the river, below the city of Kichau, is a *fixed* light of the sixth order, dioptric, elevated 32 feet, visible in clear weather a distance of 7 miles, when bearing from N. 35° W. through north and east to S. 25° W.

WARD REACH, which trends about N.N.W., appears to be quite safe and clear; the left bank should be neared when passing the hills on that side (at the northern end of which there are some rocks close to the shore), and kept throughout the reach, as extensive sand banks skirt the opposite shore at its northern part.

Ki-tau, or Cock's head, 16 miles above Kichau, may be passed close to. It is a remarkable bluff on the right bank, rising perpendicularly to a height of 300 feet, and cannot be mistaken. The right bank below Kitau has grown out considerably, necessitating the utmost caution whilst passing the bend.†

YANGLOW and 10-FOOT ROCK LIGHT.—Light-boat No. 5, is moored opposite the point and at 10-foot rock. From 1st November to 30th June at the latter spot, and the remainder of the

* From the latest information Outer Rock dries at 8 inches, and Inner Rock at 5 feet; using the zero of Hankow.

† It is stated that on the hill which bears W. ¼ N. 4 miles from Ki-tau, a *red* light has been established, visible 4 miles, which serves as a guide to clear the Lee rocks. Remark Book, H.M.S. *Albatross*, 1883. This light is not mentioned in the Chinese official list.—Ed.

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year at the former. Its position is altered as necessary. It is dioptric of the 6th order, exhibiting a *fixed* light visible all round, elevated 32 feet above the water, and in clear weather should be seen 7 miles. The light-boat has a mast and ball.

Lee Rocks.—A dangerous bed of rocks, which uncovered 1 foot in 1873 and which dry when the water is at 6 inches, lie abreast some limestone quarries at Shih-wui-yau, a place on the right bank, 3 miles above the Cock's head. To clear them, vessels should close the sand bank when passing keeping in 6 to 7 fathoms water and be careful not to approach the right bank until Cock's head is touching the low point of the opposite or north shore, when the Lee rocks will have been passed to the northward. The right bank must now be kept aboard, for the shoal off the opposite shore has so extended as to render the utmost care and circumspection necessary whilst passing this bend.

Lee Rocks LIGHT. *Red.*—Is situated on a bluff about 1 mile above Lee rocks, it is exhibited from a stake lantern hung from a single pole 60 feet in height, visible half a mile.

Three miles above Lee rocks is Whang-shih-kang, a densely populated little town, with its river wall and balustrade of yellow sandstone, situated under the northern spur of the rugged limestone range just past, and chiefly inhabited by quarrymen.

Whuylungki Rocks.—At the upper part of this bend and on the left bank, 2½ miles above Whang-shih-kang, and just below where the river splits round Collinson island, is a small rocky hill, 70 feet high, northward from which is the Whuylungki, a very dangerous ledge of rocks extending nearly 200 yards into the river, and more than a mile along the bank.

COLLINSON ISLAND LIGHTS.—Light-boat No. 4 is moored at the lower end of Collinson island from July 1st to December 31st, and at the upper end of Hunter island from January 1st to June 30th.* It exhibits a *fixed* light, dioptric 6th order, elevated 32 feet above the water, and visible 7 miles when not obscured by the land. The light-boat has a mast and ball.

Light-boat No. 3, exhibiting a similar light in all respects, is moored at the upper end of Collinson island on the north bank from 1st January to 30th June and on south bank to Mark cut-off from 1st July to 31st December.

Collinson Island and Bar.—The river proper runs eastward of Collinson island which is 5 miles in length, and has to be taken in winter. It must be entered carefully, passing between the Whuylungki rocks and the spit extending 7 cables from the south point of Collinson, above which

* Chinese Official List. Their positions are altered as necessary.

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keep along the bight. Off the north end of the island is an extensive sand-bank, and bar during winter of only 11 feet; an indifferent mark for passing north of the sandbank is, by keeping the summit of the Si-shan hills at the head of Paho reach in line (or a little shut in) with Yan-ki, the first point above, about W. ½ N., but a careful lead is the best guide here,* for as these banks are shifting the above mark might lead over the edge of the shoals to the northward, which are middle grounds. This mark will lead up to the Paho bar and Peh-kwe rocks.

Ayres Channel, west of Collinson island, is a cut-off of 2½ miles. If proceeding by it hug the point opposite Whuy-lung-ki, and then pass through in mid-channel. This channel is again divided, at its upper extremity, by Poole island, west of the north end of Collinson, and when closed by the bar at its north end deep water may be found in the narrow passage between Collinson and Poole islands, through which a northerly course may be steered. If there be good water throughout Ayres channel keep moderately near the right bank round Yangki point into Paho reach.

PAHO REACH.—After passing a small ridge of hills, on one of which is a remarkable and conspicuous boulder, continue along the south bank, passing the small village of Tsi-ku-kang, 7½ miles above Collinson island, above which keep well over to the north side to avoid two rocks 1½ and 3 miles above the village. This reach is almost choked with shoals which are shifting, and is in consequence subject to constant and rapid changes, and in some years a bar of 10 feet has formed just eastward of Tsi-ku-kang. The only description that can be given of these shoals is that they are for the most part middle grounds, and that their positions are uncertain; and the navigation of the reach is only safe with the most recent information that can be obtained from pilots or the captains of the river steamers running between Shanghai and Hankow.†

A small stream enters the Yangtse at Paho, a small town substantially built of red sandstone on the north bank at the east end of the reach; the plain to the northward, where there are some lakes, is inundated in summer.

Peh-kwei and **Wuchang Rocks.**—The Peh-kwei rock is N.E. by E. of Wuchang pagoda, and nearly mid-channel; it dries about 25 feet in February, and is visible from the middle of November to the middle of April. The rock off the town of Wuchang is about one third across the

* Early in September 1865 two vessels, under charge of experienced pilots, grounded on this bar just as the water was beginning to fall, and it took five river steamers to tow one of them, the *Fire Queen*, off.

† From Remarks of J. M. Hockly, Esq.

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river and dries 17 feet, being above water from the end of November till the beginning of April.

Bythesea Channel.—The town of Whangchau on the left bank is 3 miles northward of Wuchang, and abreast it the river divides into two channels round Squeeze island. Bythesea channel, the western of the two has not been used since 1874, while the eastern channel is clear.

Northward of these channels the river is clear for 4 miles up to Gravener island, but a spit projects from the upper end of Squeeze island for 2 miles, which must be carefully avoided.

GRAVENER ISLAND, round which the river turns by a sharp bend to the eastward, is 3 miles across at its broadest part.

The present channel lies between the west shore of Gravener, which is fast washing away, and the banks extending for more than a mile eastward from Wills island; it is of a horse-shoe form; a mid-channel course should be steered through it for Pau-hia-ki cliffs.

LIGHT.—No. 2 light-boat is moored at the upper end of Gravener island,* and exhibits a *fixed* light, dioptric, 6th order, which is elevated 32 feet above the water, and is visible all round for 7 miles. The light-boat has one mast with ball. It is shifted up the river on the spit as the water falls. The spit is steep-to.

LO-KOH-HI REACH, or Washington reach, as originally named, is foul, having several middle grounds and the south shore being rocky. The course now adopted is from Pau-hia-ki cliffs S.W. by W. ½ W. westerly to Porpoise bluff,† 300 feet high, which may be rounded mid-channel, being careful of the tide eddies, also the Six Chicks rocks N.W. of the bluff, and some rocks off Lo-koh-hi, which extend nearly 200 yards from the right bank, also of the sandbank off Bouncer island, which forms the north side of the channel, and which has extended considerably into it. Pih-hu shan or White Tiger hill, a prominent elevation of about 400 feet and 2½ miles westward of Porpoise bluff, is also kept aboard. W.N.W. from Porpoise bluff is the entrance of the Huquang channel, north of Bouncer island, a cut-off of 1½ miles, which may be used by light draught vessels when the water is at 20 feet.

Six Chickens Rocks.—Six Chickens rocks lie about 200 yards off the Bluff and dry when water is 10 inches at Hankau. A wreck

* Position altered as necessary.—*Chinese Official List.*

† Navigating Sub.-Lieut. J. G. Fowling remarks :—that there is much chow water off the bluff which requires careful steering and good speed to round, being the worst spot between Kiukiang and Hankau.—Remark book, H.M.S. *Swinger*, 1875.

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is visible on them with water at 10 feet. The channel is only 200 yards across with strong eddies and chow-chow water, and great care is required here. Vessels should keep mid-channel between the Bluff and upper light-boat.

Caution.—Even when the current above Kiukiang is feeble, at the Six Chicks rocks it is found from 3 to 4 knots, and a vessel passing must keep the light-vessel on the sand spit opposite close on board, to avoid being set on these rocks during the winter months.

YANGLO REACH.—At 2 miles above White Tiger hill is another crossing above Bouncer island, the right bank having shoaled out a considerable distance,* but when White Tiger hill bears south a N.N.W. course should lead clear through the reach free from any impediments to the small town of Yanglo, a mile above the ruin, which may be approached close to, but not the point north of it, for off it is a rock that would be covered after April.

Bouncer Island LIGHT.—Light-boat No. 1, moored† at the lower end of Bouncer island, exhibits a *fixed* light, of the sixth order, dioptric, which is elevated 32 feet above the water, and is visible 7 miles. The boat (which has one mast and ball) is stationed on the north side of the spit to mark the cut-off from the 1st July to 31st December, and on the south side from 1st January to 30th June.

YANGLO LIGHT BOAT (No. 5).—On low point, above and opposite Yanglo, and 8 miles above White Tiger hill, is a *fixed* light, dioptric 6th order, elevated 32 feet above the bank, and in clear weather should be seen from a distance of 7 miles. From 1st November to 30th June it is stationed at the 10-foot rock Kitau. The light-boat has a single mast with ball. (*See also* page 491.)

PAKINGTON REACH.—Shakau is a village under a flat topped hill, and lying in the bight north of Low point, which bight is rocky; and between Shakau and the creek above it, the shoal extends about half a mile off the north shore. Keep the left bank well aboard through Pakington and Hankow reaches right up to Hankow, for the south shore is bordered by an extensive shoal which contracts the channel for several miles, especially at a part where Kinshan, a remarkable bluff one mile inland bears South.

HANKAU REACH is clear as far up as the British Concession at the lower part of Hankau 13 miles above Low point, although the right

* J. M. Hockly, Esq., R.N. † *Chinese Official List.*

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bank is shoal. There is a shoal from 9 to 12 feet on it just above the creek at Wu-chang-fu; and another one on the right bank a little below Kuen-kau. Also a shoal with 9 to 12 feet water on it extending from the left bank on the upper side of the creek at Kuen-kau. Close to the right bank off the Red cliffs 60 feet high there is a ridge of rocks about 6 feet above water. Off Siau-kin-chan, or Little Golden hill, the bank shelves, and is shoal from some distance from it; and below the hill, near the right bank, is a rock covered at low water, and marked by a sampan until there is sufficient water for junks to pass over it.*

After passing close to the walls of Wuchang, haul out to avoid the shoal off the creek, and steer nearly mid-channel, keeping nearer the left bank than to the right until abreast of Great Golden hill, when keep the left bank until nearing the bluff in King-kau reach.†

Hankow is situated on the left bank and immediately below the mouth of the Han, which flows into the Yangtse from the north-westward.

The river Han, sometimes called the Siyang ho, is the largest tributary of the Yangtse on the north. It rises in the south-west of Shensi, and drains the south of that province and the whole of Hupeh, in its course of 500 miles; its basin is estimated at 100,000 square miles. The city of Siangyang, about 200 miles up its course, is the port of transhipment on the route to Pekin and Tientsin.

Above the Han, the Yangtse passes through a group of hills isolated on the vast plain through which it here flows. On these hills on either bank are the walled cities of Hanyang fu and Wuchang fu. Hanyang, on the left bank, is inconsiderable even with its suburbs. It is conspicuously situated, its walls passing over a barren ridge, called the Ta-pieh, "the great dividing mount," the summit of which, overlooking the Han and crowned by a pagoda, commands the three cities.

Wuchang, opposite, and on the right bank, is the capital of Hupeh, where the Governor General of the two provinces Hupeh and Hunan resides. It is fortified, and has a double-bastioned wall along the margin of the river. A ridge runs through the centre of the city, commanding a view of the whole space within the walls. The population of Wu-chang is not openly unfriendly to foreigners, but the troops occasionally quartered there, as also the students periodically assembled for examination, have more than once given cause of complaint by acts of rudeness and even of violence towards foreigners passing through the streets.

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*† *See* Admiralty charts:—Yangtse-Kiang, sheet 5, Hankau to Yoh-chau-fu, No. 2,849; sheet 6, Yoh-chau-fu to Kwei-chau-fu, No. 1,115.—Commander Theobald, H.M.S. *Kestrel*, 1877.

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HANKAU Treaty Port is 134* nautical miles above Kiukiang, 586 from Shanghai, and upwards of 600 from the sea. The position of the sandbank south of the Han entrance and east of Hanyang pagoda, is lat. 30° 32′ 51″ N., long. 114° 19′ 55″ E.

This city is the most celebrated of the native marts of China, and ranks amongst the five *chén* or principal commercial centres of the empire.† It is said to command the most extensive network of river communication on the face of the globe, which has given it prominent commercial importance from a very early period.

Hankow extends for a mile along the left bank of the Yangtse, and 2½ miles along the Han, but occupies no great depth inland. Two streets, crossed by other curved streets leading to the waterside, traverse the entire length of the city in parallel lines. The custom house is at the lower extremity of the town, near a fort, also the foreign concession ground and consulate. Thrice destroyed by the Taipings, the vitality of Hankow as a great mercantile emporium is remarkable, and strikingly points out the value as well as necessity of this locality for commercial purposes. In 1863 a defence wall‡ and creek were constructed, enclosing a rectangular space of about four square miles. The population has been estimated of late years at 600,000, and that of the three cities at about 1,000,000.§

The British Concession is at the lower extremity of Hankau, having a frontage of 800 yards, with a wide bund along the river side accessible by five jetties, whilst above and beyond its limits the various mercantile houses, whose steamers run between Hankow and Shanghai, have established wharves for their accommodation. The consular buildings occupy the lower part of the British Concession, next are those of the Chinese maritime customs, and beyond, the French and other foreign settlements. There have been three hospitals established, one by the foreign community, a second by the Wesleyans, and a third by the London Missionary Society.

Supplies, Trade, &c.—The markets are well supplied with beef, mutton, and poultry, and game is abundant in the cool season. Prices do not vary much from the rates prevailing at Shanghai. Several foreign stores are established for the supply of imported articles. The river water, if filtered, is said to be both pure and good. Excellent iron is procurable.

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* 145 miles by the bends of the river.

† These are Hankow, Fatshan near Canton, Siangtan in Hunan, Kingteh in Kiangsi, and Singan fu in Shensi.

‡ The wall is of stone, 13 feet in height and 4 miles long; a brick parapet raises the structure to a height of 18 feet.

§ In 1874. Though there is no later information, its population is probably now far in excess of these numbers.—Ed. 1884.

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Hankow had once an extensive salt trade, which recently has shown signs of recovery.

The native coal brought to market has improved in quality of late years, and most of the steamers running on the river take supplies of it. It comes from the adjoining province of Hunan where there exists an enormous coal field near Kao-ching-fu, extending over 30,000 square miles, supplying the greater part of central China.

Although the anticipations of foreigners in regard to the trade were not at first realised in consequence of the competition and combination of Chinese merchants and compradors, of late years it has been progressing steadily, owing to the increase of the direct importation of goods. In 1871 the native produce exported amounted in value to 5,578,258*l.* sterling, of which tea has formed the staple, and constitutes one-half the total value. Silk, drugs, hemp, oil, tobacco, timber, coal, wax, tallow, &c. are also chief among the exports. The imports, foreign and native, have amounted in value to 6,756,631*l.*, embracing cotton and woollen goods, opium, sugar, paper, seaweed, &c., and copper cash necessary for the purchase of teas; while in 1881 the gross trade of the port amounted in value to 12,772,685*l.* sterling. There entered and cleared, in 1881, 1,295 British and other foreign vessels (representing in tonnage 917,235 tons), of which 522 were British steamers against 396 of other nations.*

Exchange is confined chiefly to drafts upon Shanghai, and three foreign banks have agencies here. The standard of sycee silver is about 2½ per cent. higher than at Shanghai, and much debased silver is in circulation, but all sycee can now be officially tested. The Mexican dollar passes current, but accounts are kept in taels, of which 97½ are generally equal to 100 Shanghai taels.

There is regular steam communication with Shanghai and the intermediate ports three or four times a week. The up journey occupies about 4½ days in September, the return passage 2½ days.

The Climate is dry, and hence far healthier than that of Shanghai notwithstanding the yearly inundations. The summer is hot, but not so trying as on the coast, although the degree of heat recorded is frequently far higher than any ordinarily reached at the more southern ports. The hot weather may be said to last until the middle of September, and from this period to December, highly enjoyable weather prevails, the thermometer gradually falling to freezing point, which it usually reaches towards the new year. Snow and ice occur during most winters, but are of no long continuance.

The following particulars of the weather have been recorded :—†

* Consular Reports, China, 1881.

† Remark Books of Commander C. C. Rising, R.N., H.M.S. *Midge*, 1871, and Navigating Sub.-Lieut. J. G. Fowling, R.N., H.M.S. *Swinger*, 1875.

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January.—Prevailing winds N.E. and E. round to S.E., fine and cold Three N.E. gales occurred, accompanied with heavy sand storm, one continuing 3 days. Snow fell, maximum barometer 30·70 inches, minimum 30·01 inches. Thermometer maximum 58°, minimum 27°. River falling.

February.—Prevailing winds N.E. with three strong gales from sam quarter, being occasionally to N.W., accompanied with rain; light winds from other quarters on 3 or 4 days. Generally dull and cloudy. Snow fell, maximum barometer 30·52 in., minimum 30·19 in. Thermometer maximum 59°, minimum 30°. River falling, but very slowly at the end of the month. Seven days rain.

March.—Prevailing winds N.E. to N. with one strong gale, southerly, and calm on 10 days, and rain on 7 days. Generally squally and rainy, maximum barometer 30·6 in., minimum 29·85 in. Thermometer maximum 78°, minimum 37°.

April.—Prevailing winds N.E. to N.W. with calms, three strong gales from N.E. veering to N.W., blowing hardest with fine weather, and becoming overcast and rainy as the wind moderated; continuous rain on 8 days, S.E. and S.W. winds on 13 days. On the 12th April 1875 river began to rise, and continued rising the latter part of the month very slowly. Maximum barometer 30·34 in., minimum 29·73 in. Thermometer maximum 88°, minimum 45°.

May 1875.—Generally cloudy and rainy, winds variable. Prevailing winds from North round by East to South for 19 days. River rising rapidly to 22nd, from that date to 30th fell 2 ft. 6 in. On 31st again rising. Maximum barometer 30·11 in., minimum 29·66 in. Thermometer maximum 92°, minimum 58°.

In June and July the wind is from N.E. or up the reach, sometimes half a gale. Rain fell 21 days in June in 1875. Country round the concession flooded. Maximum barometer 29·90 in., minimum 29·46 in. Thermometer maximum 88°, minimum 64°.

In July 1875, maximum barometer 29·74 in., minimum 29·46 in. Thermometer maximum 98°, minimum 75°. Current running sometimes 5·5 knots in mid-channel. River falling from the 13th.

In the early part of August the weather is wet and very unsettled. August 1875.—Very hot, a dry month; only 1 day's rain; calms. Barometer maximum 29·93 in., minimum 29·55 in. Thermometer maximum 104° under awnings, minimum 78°. Three cases of heat apoplexy—one fatal. River falling.

In September the winds are generally N.E. and North, with occasional calms and light airs from S.E. to West; N.E. winds are usually accompanied with rain. Temperature, 87° to 70°.

In November the same winds prevail for two-thirds of the month, with scarcely any rain. A north gale may set in suddenly and last for three

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days, but the barometer gives good warning. After a strong blow it is necessary to lift both anchors, as otherwise they get buried by the mud and sand brought down by the increased current. Temperature, 67° to 48°.

In December light North and N.E. winds prevail, and there is little rain. There are occasionally N.W. gales, accompanied with storms of dust from the neighbouring plains. Slight frosts occur. Temperature, 61° to 31°.

RISE and FALL of River.—At Hankau the river rises in summer from 39 to 50 feet above its winter level. The observations taken by Mr. J. H. May (Tide Surveyor and Harbour Master, Hankow) between the years 1864 and 1870 gave the following results :—

Mean high level - - - -	45 ft. 2 in.
Mean low level - - - -	0 „ 6 „
Mean rise and fall - - - -	44 „ 8 „

A register of the daily rise and fall of water has been also kept from 1868 to 1880. The lowest water in February 1868 is taken as zero.

In March 1873 it fell 8 inches below this zero. The highest water was in August 1870, the water rising to 50 feet above zero.

There is generally but little fluctuation when at its highest or lowest level, rising or falling a few inches only during several weeks, and then commencing to alter rapidly.

The banks begin to flood at 38 feet; at 40 feet most of the low land is covered, and at 45 feet the whole of the low land is flooded, in many places resembling a large lake. At these times the navigation is very difficult; good local knowledge is required.

Record of rise and fall of tides at Hankau.

Low water.				High water.			
0 ft. 0 in.	-	February 4th	1868	October 19th	-	44 ft. 4 in.	
10 „ 6 „	-	January 28th	1869	July 23rd	-	49 „ 0 „	
0 „ 2½ „	-	March 9th	1870	August 4th	-	50 „ 6 „	
1 „ 2 „	-	February 5th	1871	September 6th	-	43 „ 4 „	
4 „ 7 „	-	January 25th	1872	July 9th	-	46 „ 3 „	
8 in. below zero		March 2nd	1873	„ 26th	-	43 „ 0 „	
3 ft. 5 in.	-	January 29th	1874	„ 22nd	-	38 „ 2 „	
4 „ 3 „	-	„ 14th	1875	„ 10th	-	45 „ 0 „	
1 „ 5 „	-	„ 26th	1876	August 26th	-	43 „ 9 „	
0 „ 2 „	-	„ 26th	1877	May 23rd	-	34 „ 4 „	
1 „ 6 „	-	„ 30th	1878	August 6th	-	48 „ 10 „	
2 „ 9 „	-	March 2nd	1879	July 24th	-	41 „ 4½ „	
0 „ 7 „	-	January 11th	1880	„ 30th	-	39 „ 7 „	

In April the water sometimes falls. In 1873 it fell 5 feet in the first 8 days of the month. The subsequent rise is generally so much the greater.

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The banks of the river, rocks, and sandbanks between Hankau and Kiukiang marked as being flooded at a certain number of feet rise, thus, "point covered at 38 feet," refers to the height of the water above zero at Hankau.

Commander H. Royse (of H.M.S. *Sheldrake*, 1876) gives the following records of the state of the river in different years:—

				feet	ins.
In February 1876 the water		rose	- - -	15	5
March	„	fell	- - -	1	5
April	„	rose	- - -	12	1
May	„	„	- - -	2	1
June	„	„	- - -	11	7
July	„	fell	- - -	0	9
August	„	rose	- - -	0	8

On August the 8th, 1876, the height of water was 41 feet 7 inches.

On January the 27th of that year the river reached its lowest level, viz., 1 foot 6 inches, and on July 5th, its highest level, viz., 42 feet 10 inches.

				feet	ins.
In February, 1876, the rise in	5	days was	- -	6	8
April	„	„	7 „ - -	7	4
June	„	„	7 „ - -	10	2

Great rises in former years:—

	feet	ins.
March, 1870, 14th to 18th, 4 days - - -	7	3
April, 1870, 18th to 23rd, 5 days - - -	6	8
March, 1871, 17th to 23rd, 6 days - - -	8	6
April, 1871, 22nd to 4th May, 12 days - -	14	6
June, 1871, 8th to 15th, 7 days - - -	11	10
June, 1873, 8th to 17th, 9 days - - -	11	0
February, 1874, 10th to 16th, 6 days - -	7	8
March, 1874, 23rd to 30th, 7 days - - -	8	8
March, 1875, 11th to 21st, 10 days - - -	11	2

In 1866 the water was at its lowest level about the end of January, and attained its highest level on the 10th of August. In that year the water fell nothing during January, but more commonly it falls 10 feet during that month, and commences to rise the first week in February. It will be remarked that the subsidence is more gradual than the rise, which may be attributed to the influence of the dry season, whilst on the contrary the great fluctuations in the rise are probably due to the varying periodicities of the rainy seasons in those regions through which the upper courses of the Yangtse and its tributaries flow. Heavy rains may cause a rise of

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2 feet in a single day, and it has also been remarked* that the slower the velocity of the stream, the greater has been the rise of the river, amounting on one occasion to 2 feet in 12 hours. A sudden thaw when the hills are covered with snow also raises the level. In January, south winds cause the water to rise, while north winds cause it to fall.†

The country surrounding Hankau is generally under water from July to September, leaving the three cities like islands with water around as far as the eye can reach, and in some years the water is so high as to cause almost an exodus from the city, the richer portion of the inhabitants removing to Wuchang, and the poor to the neighbouring hills, whilst those who remain have to inhabit the upper stories of the houses. The foreign settlement has also been under water. The river bank at Hankua is composed of sandy soil, and the river of late years has made great encroachments on the city.

Velocity of the Current.—This has been variously estimated. At Hankow, during a freshet, it was found by repeated measurements to be 5½ knots, but its general rate was from 2½ to 3 knots and sometimes less. During the first ascent of the Yangtse in December, the current was found by the surveying officers to run from 1½ to 4 knots, the latter rate prevailing only in particular localities. At the anchorage 100 yards off the bund it has been estimated as 3½ knots, in July, 3½ to 4 knots, in August, 2½ to 3 knots, in October, 1½ to 2 knots, in November, and ½ knot to 1½ knots in December. In summer the strength of the current is stated to be from 4 to 4½ knots, and 5 to 5½ knots at freshets. In the latter season a diminished rate will also be found in the cut-off channels.

During the latter part of June 1865, the freshes out of the Han river were so great that the steam vessels in port had to use steam to prevent their driving, and many junks and timber rafts which were anchored off the mouth of the Han parted their cables, and drove athwart-hawse of the vessels anchored off the Concession. Much damage also resulted from the fouling of the foreign vessels. The current was estimated at from 5 to 8 knots, and at such times it is recommended to shift berth to the opposite side of the river where the current is moderate.‡

ANCHORAGE.—The anchorage is off or a little below the settlement in about 7 to 10 fathoms, soft, sandy mud, at about 1½ cables from the bank. In the high level season it is very bad indeed, but must be made the best of. Scarcely a ship, it is said,§ remains there without losing one or

* Remark Book of H.M.S. *Slaney*.
† Remark Book, H.M.S. *Moorhen*, 1880.
‡ Wm. King, Master, R.N., 1865.
§ Remarks of Archibald Miller, Second Master, R.N., H.M.S. *Slaney*, 1866.

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more anchors, for besides the strength of the current and the nature of the bottom, many broken anchors are scattered about this part of the bed of the river. It is necessary to sight the anchors constantly, or they become so imbedded in the soft mud that they cannot be weighed.* The best position is just below the Concession and between it and the defence wall lately erected for the protection of the place, where the ground is more free from lost anchors, and less tenacious; a vessel lying here is also less liable to be disturbed by the timber rafts which frequently, during freshets, break adrift from the banks higher up where they are moored. These rafts are of immense size, frequently covering an area of half an acre, and drawing 15 feet water, so that should one get athwart-hawse, a vessel might be carried miles down the river before she could be got clear.

The prevailing winds in the early part of the year are from N.E., and if not moored during fresh winds ships are liable to foul their anchors by overrunning the current, which is from 1 to 1½ knots.

Off the settlement the chow-chow water causing vessels to sheer about dangerously, renders it necessary to sight anchors about once a week during the summer months.

The following is extracted from the Remark Book of Navigating Sub-Lieutenant Charles C. Jeffery, R.N., H.M.S. *Mosquito*, 1880:—"The season of 1880 will be remembered as one of the worst with regard to casualties caused by chow-chow water on the Yangtse. Steamers with engines at command parted their cables like pack thread, and in some instances the results were very disastrous. During the tea season, some 14 anchors were lost with a great quantity of cable attached. The *Mosquito* took 2 round turns in her cable in less than 10 minutes and was obliged to be shifted over to South Bank, this is certainly the proper place for ships to be when freshets are likely. As an instance of how the river shifts I may state that one day getting 7 fathoms alongside, the next, only 5 were obtained, and this bank was swept away during the next 48 hours. Great difficulty was at times experienced in weighing anchors, on one occasion when working cables for the purpose of sighting our anchor, the chain was found 'up and down,' although with 2½ shackles still out (7 fathoms water), not another link could be hove in with the biggest purchase procurable; the slip having been put on, the cable was rove through a rum cask (weighted with round shot), the cask was then let go, and travelled along the cable until it reached bottom; the eddy caused by this obstruction swept the sand, &c. away, and eventually the anchor was

* The anchors of H.M.S. *Slaney* were sighted twice a week, and sometimes, after being only three days down, it was with the utmost difficulty they were started. The anchors were supposed to be buried under the alluvial matter which is deposited here in large quantities. In July 1865, after heavy freshes out of the river Han, some vessels were unable to weigh their anchors at all, and several lost one or more during the inundations.

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sighted. If anchored on the south bank a vessel is comparatively free from rafts, the set of the current sending them towards the north shore. A large number of junks are annually capsized or sunk through collision at the entrance of the River Han, and these being swept along the bottom and coming into contact with vessel's cables are, I believe, often the cause of their parting."

The squadron in December, 1858, anchored in 3 to 7 fathoms just above the mouth of the Han on the tail of the middle ground which lies abreast Hanyang hill, and in some seasons stretches nearly across the river. This sandbank is usually formed in autumn, and is left for the most part dry from December to March, but sometimes disappears in summer altogether.*

The Yangtse has a depth of 10 fathoms off the mouth of the Han in December, decreasing to 6 fathoms off the custom house; but as the river rises 6 fathoms by July, the inconvenient depth at that season and the force of the current cause an anchorage in the Han to be preferred, in which the stream is less rapid and the depth 18 fathoms.

DESCENT OF THE YANGTSE.

HANKAU to KIUKIANG.—The downward voyage from Hankow is at all times one of danger and difficulty. In the summer months the excessive velocity of the current renders necessary the utmost degree of skill and caution, the time of rapid subsidence (see page 502) being an especially precarious period and the occasion of many wrecks, for should a vessel ground there is little hope of her escaping total wreck. In summer the banks for many miles are under water and the channel is only visible by its turbid and turbulent appearance, and when the maximum strength of the current has abated, the river has greatly fallen and new dangers are encountered in the natural obstructions and shoals, some of which may be newly formed, and the alterations which take place from year to year are so great that the most experienced pilots are often at fault; still if a pilot can possibly be procured no vessel should attempt the descent of the river without one.

Though sea-going vessels load at Hankau and sail direct for England, the loss† of many valuable cargoes arising from the difficulties of the navigation has led to the introduction of a class of powerful river steamers.

In connexion with such accidents it has been suggested‡ that a ship should be towed down alongside the steamer, stern foremost, with at least

* In the summer of 1861, this bank was entirely swept away in one night by the freshes.

† The *Guinevere*, in June 1866, with a cargo of 9,000 chests of tea, became a total wreck about 50 miles below Hankau, and this calamity was followed by the stranding and loss of several other vessels in different parts of the river.—*Treaty Ports of China*, p. 453.

‡ Published at Shanghai in June 1866.

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three bower anchors ready for letting go. By this plan the vessel with the additional assistance of the steamer backing astern would be brought up immediately.

In the season of inundation, the banks for miles are under water, though in most places the position of the land may be distinguished by the still glassy appearance of the water, compared with the turgid yellow of the main stream. Indeed it may be taken as a rule throughout the river, that where rough, broken looking water is seen, there is the best channel.*

After leaving Hankau, nothing can be seen distinctly for the first 6 miles, then some houses appear which mark the beginning of the Kinshan shoals, abreast the shoalest part of which the left bank is plainly seen for about 2 cables, and its position more or less shown for about 6 miles farther by a number of clumps of trees and houses. The water here shoals from 15 fathoms near the left bank to 3 fathoms on the other side. Approaching Yanglo, (neither bank being visible though the beacon light on Low point is a guide,) steer E. ½ S. for a tree on the end of a point to the left of the highest part of the range. After passing Yanglo keep it nearly right astern, steering about S. by E. ½ E. for where the westernmost shoulder of White Tiger hill joins the next low hummock to tha westward of it, making of course allowance for the current. Bouncer island is seldom entirely under water, some patches of grass being visible, and after passing this the principal difficulty is over, as one bank or the other is almost always visible.

After passing Porpoise bluff steer nearly straight for Pau-hia-ki cliffs (borrowing on the north shore as Rocky bank is approached), and when northward of them and abreast two trees and five or six huts lying together on the left bank, continue on a course of about W. by N. for the light boat stationed on the spit N.W. of Gravener island. Now close the western shore of Gravener island, rounding its S.W. point, the submerged bank of which is indicated by the houses, making due allowance for the current, which here runs nearly five knots.

Below Gravener island both banks are visible for six miles, after which they begin to be flooded, principally the right, the left only partially so near Whang-chau, below which town they are again visible all the way down to Collinson island. After passing Boulder rock keep close to the right bank till a conspicuous house at Paho on the left bank bears N. by E., when commence to round the point of Yangki at 1½ cables, increasing the distance gradually to 3 cables abreast a conspicuous, thin, withered tree, being then in 5 fathoms, haul in again gradually till abreast a small village with some bushy trees right on the edge of the bank, with 8 fathoms

* Archibald G. Miller, Second Master, R.N., H.M.S. *Slaney*, and the author of the following directions for descending the Yangtse at the period of inundation.

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close to. Keep still along the right bank passing a small rocky bluff, and afterwards a small joss house with two large trees ; then steer S. by E. ½ E. for two small red hummocks or cliffs lying to the left of a noticeable tree on the edge of the river bank, and which lies in line with the most remarkable part of the high land behind it. Collinson island is almost entirely covered, only showing where the middle channel branches off where it is rather high and sandy, and also near its lower end where patches of grass are visible at intervals. The right bank opposite its lower end is also marked by a few trees, and the point opposite Whuy-lung-ki also shows.

Ayres channel is used when the water is at 20 feet. For the Winter channel, after passing Yangki steer for the Light boat on an E. by S. course 3½ miles, then follow the left bank of the river until the south point of Collinson bears W.S.W., when a mid-channel course may be taken S.W. by W. until Whui-lung-ki bluff bears east.

After passing Collinson island the principal difficulties have been got over and none of any consequence are encountered between it and Kiukiang, for although the banks in some places are submerged they are distinguishable, and with ordinary caution may be avoided. The light-boats also and the beacon lights which are now established are effectual guides.

KIUKIANG to CHINKIANG.—Oliphant island presents the first difficulty after leaving Kiukiang, for at its lower end where the various channels meet, both banks are flooded. After passing the bar, a clump of trees in the hollow between two hill tops kept right ahead will lead through, and the east point of the island is marked with beacon and light. The only other difficulty is at the lower part of Christmas island, where the country, very flat and without trees or houses, is flooded ; but Eagle island on the east side of the channel shows, from which a N.E. by N. course leads down towards Nganking. The low points, as a rule, are all flooded; and as regards the bights, it has been observed that the flatter the bend the less is the overflow, and the sharper the bend the greater the overflow.

CHINKIANG to the SEA.—The highest rise in summer being 14 feet, the river banks are less submerged. Plover point is sometimes inundated, but as the channel of the river is buoyed, its navigation is not affected thereby. *See also* page 453.

Note.—The voyage up to Hankow is accomplished, by the fine class of fast steam ships which trade regularly between Shanghai, Hankow, and the intermediate ports, in from three to five days, inclusive of stoppages of from one to six hours at each of the treaty ports, whilst the journey down occupies from 40 to 50 hours. Fares are charged at the following rates from Shanghai:—To Chinkiang 20 taels, to Kiukiang 50 taels, to Hankow 60 taels; or for the voyage to Hankow and back 100 taels.

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THE UPPER YANGTSE.

HANKAU TO YOHCHAU.*

VARIATION in 1874, 0° 2° East.

The further navigation of the Yangtse† to Yohchau, at the entrance of the Tung-ting lake, 122 miles above Hankow, presents no difficulty if the track indicated by the soundings on the chart be followed, the depths of which refer to the level in March, when the river had risen about 6 feet. Owing to a bar of 15 feet, 90 miles above Hankow, vessels only of 15 feet draught can pass up at the middle of March, but the rise of the river at that period is very rapid. The river rose 20 feet at Yohchau between the 17th March and 25th June.

After passing the walls of Wuchang rather closely, so as to avoid the extensive sandbank above the mouth of the Han, the vast plain which forms the valley of the upper Yangtse is entered, which on its northern side, from above the low range crossing the river and terminating in the flat-topped Ta-kin-shan or Great Golden hill on the left bank, about 14 miles above Hankow, is unbroken by a single eminence for some hundreds of miles. Below this range are the Siau-kin-shan or Little Golden hill, and some low grassy hills on the river side 7 miles above the city; both shores are otherwise low, large tracks being partially flooded in the middle of March, and in June the whole country is under water. The large town of King-kau stands on the right bank, 1½ miles above Ta-kin-shan, and the large sand-bank off it, dry in March, will be avoided by passing close along the opposite shore.‡

CAUTION.—If at anchor or proceeding by night, beware of the numerous large rafts of timber floating down the stream. The river is frequently crowded with junks and boats of all descriptions.

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* Much of the information on the Upper Yangtse between Hankow and Pachow island is derived from the remarks of Commander Theobald and Officers, H.M.S. *Kestrel*, between 5th February and 8th April 1877, at which time the river appeared to be at its lowest, and its level nearly stationary.

† *See* Admiralty Chart of the Yangtse kiang, Sheet 5:—Hankow to Yohchau, No. 2,849, scale, $m = 0{\cdot}5$ of an inch.

‡ There are banks at intervals between Wuchang and King-kau, on the bank off which latter place there was only one foot water in December. Just off the hills I observed two rocks, in mid-channel.—Remark Book of Lieut. and Com. Geo. Morice, R.N.

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King-kau reach.—Above the bluff at Kwa-mau-hien are two rocks (dry), one on either side of the river and close to the banks; when the bluff (60 feet) was N. by W. ¼ W. and centre of 150-feet hill N.E. ¾ N., the rock on the right bank bore S.E. ¼ E., the rock on the left bank was nearly abreast of it. Off the town of King-kau is a dry bank about 1½ miles in extent, at the upper end of which are two rocks, the largest about 12 feet above water. From 1½ miles above the 60-feet bluff to the point of Mei-tan-chui the left bank is shoal. When nearing the bluff, haul out in mid-channel, and close the right bank, which may be kept on board crossing to Mei-tan-chui.

Farmer bend and Ashby island.—The right bank of this bend is shoal, and in the north part of it is a shoal which approaches near the left bank, commencing abreast the first kiln: between it and the bank there were 9 fathoms. The left bank may be kept on board all round this bend, steering for the north end of Ashby island, and keeping its east bank on board (7 fathoms) until near the south end, off which the water shoals, and steering for the village of Pae-chu, where it is well open of the bank. Keep this (right) bank, and cross the river below the village of Sang-pai-chu, and again below the Custom-house creek; round Hau-chin-kwang in mid-channel, and then close the left bank.

HOPE REACH.—The village of Hau-chin-kwang stands on a point of the left bank at the south entrance of the bend, 14 miles above Ashby island, and in turning out of the bend pass close to the point, as it is the deep water shore, and follow the left bank through Hope reach, which has several middle grounds, crossing over when approaching the village of Kuchi at its upper end, 15 miles above Hau-chin-kwan, standing on some low red earth cliffs, and keep this shore for 10 miles, till past both the broad openings of a shallow roundabout channel on the left bank, off which are extensive sands. The village of Lu-tsi-kau is above the first opening, and one mile above this is Shi-ta-kau, where there is a ruined temple, and good and cheap fish can be obtained. After passing the small hills 3½ miles above these villages, keep mid-stream or rather towards the left bank, where a brick kiln may be observed, above which, off the point, and north of a small range, is a 15-feet bar, the only obstruction in the river between Hankow and Yohchau.

There is a large middle shoal, dry, about 2 miles in extent, commencing when the town and hill at Ta-u-shan bears S. ½ W. The shoal hitherto marked in the chart above a house with Ta-u-shan S. ¼ W. does not now exist. Keep the left bank through this reach, but mid-channel near Ku-chi. There are some rocks, dry, off the red earth cliffs at Ku-chi.

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District of Kia-yu.—The channel near Lu-tsi-kau seems to be closed, except for junks, the channel now being close to the shore of the island marked in latitude 29° 57′ N., longitude 113° 44½′ E. There is a shoal, dry, about 15 feet between the island and Lu-tsi-kau, and joined to the end of the island a long dry sand-spit. After passing Kuchi in mid-channel, keep the right bank, but do not close it, until nearing Latitude and Longitude island, when steer over for the east end of the island, which has a steep bank; taking care to avoid a shoal spit which extends E.S.E. from the east end of the island across the shallow channel. Keep the south bank of the island on board until a clump of trees on the left bank bears S.W., and the steep part of the island terminates; then steer S.W. for the clump, in 3½ fathoms least water; hauling out mid-channel when nearing the clump of trees; and when abreast, closing the village of Si-dau-kwan above the bluff (60 feet) on the right bank.

SINGTI REACH.—Singti, 94 miles above Hankow, and 5 above the bar, is the most important town on the river between Hankow and Yohchau. It has a custom-house where all junks coming down the river pay toll. The great number of these and the large piles of timber along the shore, imply considerable mercantile prosperity; but at the end of June Singti is submerged with the whole country to the north, the only signs being the tops of some embankments, clumps of trees, and roofs of houses, while on the other side, the flooded valleys of the Kiun range and its extension look like arms of the sea.

From Si-dan-kwan to Tau-kau creek there are several shoals, some of which are dry, with a 4-fathom channel between them and the right bank. The least water obtained in the crossing between the point 1½ miles above Tau-kau creek and the upper end of Kwang-cha-pau village being 3 fathoms. Keep the right bank close on board after passing Si-dan-kwan until 1½ miles above Tau-kau creek, when cross the river to the upper end of Hwang-cha-pau village, then keeping the left bank (to avoid a large dry middle ground opposite Singti) through Singti reach until passing the pagoda at Kin-lo-shan, when a mid-channel course may be steered for Mud island (Cha-hau-che), closing the right bank at the red cliffs.

The pagoda at Kin-lo-shan is situated on the north bank of the lower creek.

The remarkable yellow bluff, on the right bank, 10 miles above Singti, has a rock off it which must be avoided. The upper part of this reach, 13 miles above Singti, narrows to half a mile between cliffs of red sandstone.

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YOHCHAU REACH.—Entering Yohchau reach by these narrows, keep the right bank aboard close to the cliffs to avoid Cha-hau-che island, a large bank of mud; and 3 miles higher up keep the same shore aboard close to the white sand cliffs, the only ones in the neighbourhood. On the north-west end of Cha-hau-che island there is a rock about 12 feet above water.

Mopan-shih rock (dry 4 feet on 15th March) is very dangerous until sufficiently covered for vessels to pass over it.

It consists of three distinct rocks, the highest being about 15 feet high, the second 12 feet, and the third 8 feet, with a channel between them and the shore of 7 fathoms; but the *Kestrel* closing the shore too much, on the passage down obtained soundings of 2 fathoms. The left bank of the river between Kin-lo-shan and the sand bluff, shoals gradually off it for some distance. After passing the red cliffs, haul out from the right bank to avoid a shoal off it, closing the bank again when nearing the Mopan-shih rocks; passing between them and the bank, haul out a little to avoid a reef off the village and 50-feet hill, entering Huc reach on a mid-channel course, or thence continuing along the right bank, past the confluence of the Ta kiang, on to Yohchau fu.

TUNG-TING JUNCTION.—At 116 miles above Hankow, the Yangtse, where it receives the waters of the Tung-ting lake, winds to the north-west, the outlet of the lake being 5 miles above the confluence of the streams. Passing the junction the stream from the lake runs along the low spurs of the Kiun range, 2,000 to 3,000 feet in height, and the course is along the right bank.

The Tung-ting Lake, 60 miles in length and 30 in breadth, is the largest in China. It receives the waters of three considerable rivers, the Siang, Tsz', and Yuen, which drain the province of Hunan, and furnish an important affluent to the Yangtse. This lake is situated in the south-western part of an extensive depression in Hupeh, lying on both sides of the river, in which are many similar lakes connecting with it, the whole area being 200 miles long and 80 broad. In March, the channel through it is said to carry 10 or 12 feet water for 10 miles; the depth then decreases to 6 feet and becomes so narrow that its navigation is difficult to light draught junks.

YOHCHAU FU stands on the eastern shore at the outlet of the lake, 122 miles above Hankow. As a place of trade it is unimportant. It is a walled city well situated on high ground, its chief gate on the western wall being gained by a massive flight of steps from the water. The anchorage is in 4 to 5 fathoms off the south end of the city wall, outside

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the fleet of junks always lying there. The suburb lies along the water-side to the south of the city, in which is a tall pagoda, and there is a low one on the summit of a hill inland. A shoal, a mile in length north and south (dry in March), bears from the city S.W., and about West from the large pagoda. Beyond Hope point, a promontory on the south shore, an island is seen 8 miles distant. Inland, the country is mountainous, but the neighbouring shores are low.

The productions of Hunan are such as an agricultural country furnishes, rice being the principal grain. The mountains produce timber and minerals. The coal is said to come from Pao-king, which is approachable by water from the lake. Changsha on the river Siang is the capital; and the town of Siangkan, below it, is said to be the most important town in the province.

A great number of sheep and goats, with a few ponies, were seen grazing just below Yohchau; these were the only sheep seen on the river for a distance of 1,500 miles.

TUNG-TING JUNCTION TO ICHANG FU.

The following directions of the navigable portion of the upper Yangtse are compiled from the map* and description of the river by Capt. Blakiston, R.A.,† and the notes of Lieut.-Col. Sarel, corrected by the more recent Admiralty Survey of 1859.‡ They are intended as a guide, without a chart; and distances of various places are given to enable a vessel's progress to be correctly determined. These distances are measured from the outlet of the Tung-ting lake, at its confluence with the Yangtse, 120 miles above Hankow. The river was navigated by Capt. Blakiston's party in a small junk, generally by tracking along the bank, but lines of soundings were obtained whenever the river was crossed to gain the opposite shore; the depth of the river was then, therefore, but imperfectly ascertained. In April 1869 Sub-Lieutenants L. S. Dawson and F. J. Palmer, R.N., made a more complete survey by ascending the river, as far as Kwei-chau fu in one of H.M. ships.§

Ichang fu, 250 miles above Tung-ting junction, and 366 from Hankow, may be considered the highest point navigable by our present steam vessels, which would find no more difficulty in navigating this part of the river than between Hankow and Yohchau. The easiest time to ascend would be when the river is low, about the end of March, when not less

* Published by John Arrowsmith; scale, $m = 0{\cdot}25$ of an inch.

† "Five Months on the Yangtse," by Capt. Blakiston, R.A. 1861.

‡ *See* Admiralty Chart of the Upper Yangtse kiang, Sheet 6, from Yohchau fu to Kwei-chau fu, No. 1,115; scale, $m = 0{\cdot}5$ of an inch.

§ See concluding paragraph of this chapter.

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than 3 fathoms were found at any part of the river, which, although it has only been very partially examined in this respect, may be regarded as being correct; but when the river is in flood the channels in the lower part, for the first 200 miles, are difficult to trace. Two places of lesser note, Shi-show and Kin-chow, are respectively 121 and 170 miles above the Tung-ting junction.

TUNG-TING JUNCTION to SHI-SHAU.—The river now becomes very tortuous, but no difficulty need be apprehended in navigating it during the low level period, if it be kept in mind that the deep-water channel is almost invariably close to the bank, which is steep, whilst shoal water exists a considerable distance off the shelving banks, particularly at the points. During summer, however, much caution is necessary lest the embankments be mistaken for the true river banks, as they sometimes lie considerably back. At the end of June 1861 the whole country to the southward of the Nan-tsuin hills, as far as the eye could reach, was under water; so much so, that the course of the river could only be known by the strength of the current. The waters of the Tung-ting lake were unusually high at that time, and caused this tremendous overflow.

Passing the sandy point of Hwei-yin-chau at the junction, Huc reach is entered, its course being westerly for 7 miles. The steep banks are about 18 feet high; whilst opposite, the shore slopes gradually down, or runs out into long sand points and mud flats, the adjoining alluvial country being one dead level, with scattered hamlets and trees occurring at intervals. Avoid the shelving banks through Huc reach, and crossing the river from the right to the left bank below the pagoda and joss-house, keep along the left bank until passing the break in the bank, and before coming to the kiln steer over to the right bank, and keep along it until approaching the lower end of the village of Sze-pa-kau, then close the left bank and follow it round the bend. From the kiln below Sze-pa-kau to the village the left bank is shoal.

After passing the village of Sze-pa-kau at the northern head of the bight, the course becomes southerly, on crossing over towards a point of the right bank, 2 miles above, which side must now be kept passing some mounds and a village, after which the course turns to the westward round the head of the next bend, on the right bank of which stand some lime kilns.

Camel reach is now entered by a sharp curve and stretches to the northward for 10 miles. The Nan-tsuin hills 700 to 1,500 feet in height, are seen to the north-west, with the Camel's hump, a prominent part 900 feet high, on their eastern end. The right bank must be kept close on board until nearing the south of two villages off which a spit of the bank

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extends into the river about 30 yards. The shoal at the upper end of Camel reach opposite the remarkable tuft of trees is dry from the left bank nearly two thirds across the river. The right bank must here be kept close on board; crossing to the village on the left bank from the second and smallest creek above the tuft of trees, taking care to avoid a shoal of 4 feet in the middle of the river, by keeping well up before closing the village. Ten feet was the least water obtained in sounding the crossing in boats, that depth being in the middle of the river, when the remarkable tuft of trees bear West, the river turns to the north-east.

Chay-wan-tongue.—After passing Hia-chay-wan and nearing a kiln on the left bank, steer over to the right bank, and keep along it until abreast the lower end of Shang-chay-wan, when steer over to it and keep the left bank round the bight, but keeping nearly in mid-channel after passing a bight in the bank above Shang-chay-wan, and closing the right bank above the kiln in Brine bend. The river runs north and then south round this tongue, changing to south-west and north again round the Brine bend, when it enters the Hong Kong reach, up which the course is south-west.

At the end of June 1861 the whole country to the southward of the Nan-tsuin hills, as far as the eye could reach, was under water; so much so, that the course of the river could only be known by the strength of the current. The waters of the Tung-ting lake were unusually high at that time, and caused this tremendous overflow.

Boulder Shoal.—In the lower part of Hong Kong reach is the Boulder shoal, an awkward danger, just showing above water on March 24th. It lies nearly in mid-channel, and its position may be known by a peculiar boulder on Ming hill, which is not seen in ascending the river until the shoal is approached. Ming hill is the range on the right bank of Hong Kong reach, 4 miles north-east of the Nan-tsuin hills. The Boulder shoal has much extended, and on 6th April 1877 abreast the kiln and observation spot there was only 11 feet of water. Keep close to the left bank until well past the thick trees above the kiln, and the Boulder bears S. ½ E., when cross the river to the village and white house.

Rounding an extensive point of sand, Adams point, (67 miles above the junction) opposite which is Sin-ho-kau, the river turns abruptly North for 8 miles through Bedwell reach, when a still more extensive sand point (Farmer point) being rounded, Collinson reach is next ascended for 12 miles on a S.S.W. course, along which the left bank must be kept, crossing over 3 miles below the town of Tiau-hien at the head of the reach. The sands in this reach must be given a good berth. When nearing Farmer point, steer over to it, to avoid several dry shoals off the left bank. The shoals extend from 1½ miles below the entrance to the

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lagoon to a village 1¼ miles above it. Keep the right bank round Farmer point, crossing to the left bank and gaining it above the village. Keep this bank, crossing to the two kilns as shown in the chart.

At **TIAU-HIEN** (87 miles)* a creek of considerable size comes in from the southward, flowing through the town. The plain to the south is here 25 to 30 feet above the river, and is perhaps rarely flooded. Wheat is the staple production, but carrots, and especially beans, were also largely cultivated. The western face of the Nan-tsuin hills, which rise to the height of 1,500 feet, is at the back of the town, terminating to the north in the Luk-keo shan or Ass's Ears peak, 700 feet high. The two pointed hills of Shi-show are seen in the west.

From Tiau-hien the river again takes a northerly stretch of 10 miles, through Jamieson reach, turning to the west and south round Attalante bend (97 to 102 miles).

JAMIESON REACH.—Entering this reach, keep along the sand-bank, steering over to and gaining the left bank above the village of Tiaw-hien-kau. Salamis bar, as formerly shown in the chart, does not now exist. The left bank must be kept through this reach until nearing the dry shoals off the bank, which commence a little below a small joss-house marked in the chart, at the beginning of Attalante bend, when cross to the right bank, and again to the left bank above the observation spot, and abreast of a small village.

Along the south shore of Attalante bend, is a low, extensive sand-flat, 5 miles in length, which covers in summer, and the channel is close to the north bank, in 3½ to 5 fathoms.

Francis point terminates the upper part of this bend, the western side of which point must be crossed for as soon as the depth in the bight shallows; then keep the right bank half-way up Michie reach (at the centre part of which are large sandbanks) until below a small village among some trees, where the river trends S. by W. ½ W., when this bank becomes shoal, and the left must be kept until nearing Parsons point, when steer over for the joss-house on the right bank. Keep close round the bight opposite Parsons point till the embankment recedes, when a N.N.W. course must be steered between the sandbanks, which above this project on either hand at the lower part of Salamis or Last Bottle reach.† Through the latter observe the rule to avoid the sandy, shelving shores and close those which are steep. A vast marsh, bordered by sand flats, extends for 10 miles along the right bank of this reach and Shishow reach above

* The distances in brackets signify the number of miles above the Tung-ting junction.

† There are but few alterations in this reach. Opposite the white joss-house where 2½ and 3 fathoms formerly existed; the *Kestrel*, 1877, obtained 8 and 9 fathoms, and 6½ fathoms in crossing the river.

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it, which is 20 feet high in March, but covered 4 to 6 feet at the end of June.

Shi-shau (122 miles) is a small walled town of little importance, situated on the right bank, at a very sudden bend of the river, on the slopes of a group of small hills, two of which are crowned with temples, and all with trees, the highest being about 400 feet. This is the only place the hills touch upon the river bank for nearly 200 miles, and they attract attention for a long distance. Great quantities of osiers are grown on the marsh below Shi-shau.'

From Shi-shau upwards, the nature of the river differs considerably from the tortuous character it assumes below that place. It becomes comparatively direct, and its average width is half a mile. Low islands occur, and in some reaches shoals are not unfrequent; and the nature of the banks being, excepting at the bends, no longer a guide, some caution will be required. The current is moderate in March, and far from strong at other times.

Skipper point, the tongue of land opposite Shi-shau, runs into the river with a sandy spit, and off the sands, south of the point, is a detached shoal awash, the deep water, 7 fathoms, being on the south shore. At 4 miles north-west of it, the river splits round Sunday island, in a north direction for 5 miles. The western or Stokes channel is the better of the two, the deep water being near the south bank on entering it. Below the south end of the island, the embankment is broken down, and in June a strong current sets through it out of the river. There is a considerable group of shoals off the north point of this island. The best channel is close along the right bank of the river after passing Skipper point, but there was only 8 feet in it in April 1869. The passage eastward of Sunday island is choked with shoals.

Commander Theobald remarks that from the joss-pole at the north entrance to the lagoon there is a depth of two fathoms along the right bank as far as the first of two kilns, but from the first to some distance beyond the second kiln there are several dry sand-banks, and the shoal off Sunday island has extended into the channel, below the first kiln. Nearing the first kiln haul out in mid-channel, so as to make the low bank of Sunday island, when the second kiln bears West, hauling back again to the right bank some distance above the kilns. Across the north end of this channel on 13th February, there was only 6 feet of water, and on 21st March, 7 feet was reported by the United States vessel of war *Monocacy*.

A channel was found on the east side of Sunday island, on 15th February, but the banks are so continually shifting on this side of the island, that unless Stokes channel entirely closes, it will be advisable to use Stokes

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channel. On the *Kestrel* proceeding down the river on the 21st March, the channel was blocked right across by a bar of 7 feet. Another channel was buoyed out on 1st April; between which times the river was blocked right across. Below the creek 5 miles north of Sunday island a shoal with 9 feet on it extends from the bank, and there are numerous middle shoals, both dry and covered, between this and Sunday island.

There is a remarkable tree on the left bank north of Sunday island, and 3½ miles above this is a shoal below the entrance of a creek, which renders it necessary to cross over, at the lower part of Hohia reach, towards two kilns and a joss house, where was a 2 fathoms bar in April 1869. Hohia reach takes a northerly course for 12 miles from Sunday island; there are shoals in it, and the safest course through is near the east shore.

HOHIA (144 miles) is a large village on the left bank, just below a bend to the westward. The river here narrows from 1,000 to 700 yards, and the current rushes with great force against the left bank, which has been deeply cut into, and necessitated the construction of a wall of cut stone masonry to protect the embankment. There is a large joss-house above the town. In crossing the narrows, the lead gave close to the village 14 fathoms, 16 in mid-stream, and 8 fathoms at 20 yards from the right bank, which is of sand. There is a large dry shoal about mid-channel, a little north of five kilns. Keep the right bank from the creek until passing two trees opposite the five kilns, when haul gradually out, making the left bank between two kilns and a tall joss-house at the north end of the reach, a short distance below Hohia. The embankment recedes from the river until, at a distance of 9 or 10 miles up, it is fully a mile from it, the land between this and the river being 15 feet higher than on the land side. A road is carried along the top of the embankment which is 25 yards wide. The country is richly cultivated with tobacco, cotton, rice, wheat, &c., and vegetables and fish are easily procurable by purchase.

Compton reach runs nearly West 8 miles. Creasy reach runs N.N.W. 4½ miles and then splits round Tuh-ke-chow or Storm island; and bending to the north-east, the village of Kwan-yin-shih is passed (162 miles), and Sha-sze reach entered. Swinhoe channel, the passage west of Storm island, is the deeper, the eastern channel having only 2 to 3 fathoms, with a shoal at its south part, passing which the island must be kept aboard. In June there are 6 to 9 feet on this shoal, and 4 to 6 fathoms in the channel; and a long spit of sand which stretches above a mile to the north-east of Storm island is also partially covered. Haul out a little from the right bank before entering the channel, and after passing a sand-spit off the lower end of the island, steer a mid-channel course, as there are shoals off the banks on each side, hauling in to the right bank at the bend and village opposite

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the west point of the island, crossing the river to Kwan-yin-shih joss-house between dry shoals, as shown in the chart.

Sha-sze reach.—Keep the left bank after passing Kwan-yin-shih joss-house until abreast two joss-poles in front of a joss-house, when cross the river N.N.W. to the point with trees and houses on it, taking care on closing the right bank to avoid a shoal, with 2 feet on it, outside the channel along the bank. Keep the right bank until the temple in the lower end of Sha-oze town bears N.N.W., when steer over for the temple on that bearing.

From the joss-poles and house along the left bank there is also a channel of 3 and 4 fathoms as far as the lagoon below Sha-oze, when it becomes blocked by a bar of 5 feet; it is also extremely narrow, with shoals dry and awash outside the channel, extending from the joss-poles to the lagoon. South of the Fort in ruins, and nearly mid-channel, is a shoal which dries 1 foot in April.

SHA-SZE (170 miles) is the first place* of considerable mercantile importance above the Tung-ting junction. It is the port of Kin-chau, a city which lies north-east of it a mile inland. Sha-sze is built on the left embankment, along which it runs for 2 miles; and on the whole of its face and in every creek, junks, some of large size, were moored as closely as they could be stowed. It is a port of trans-shipment, the junks from the province of Sz' chuen above, or from below, making this the end of their voyage, when their cargoes are transferred to vessels of a different description more suited to the change of navigation.

The cargoes from Sz' chuen are mostly composed of salt, sugar, tobacco, hemp, pepper, spice, opium, medicinal and other drugs, some silk and wax, and a little gold; cotton and other goods imported from Canton by the Tung-ting lake and Taiping canal connected with the lake, are taken back. Coal also is said to be brought from Hunan by the latter route.

TAI-PING CANAL.—About 4 miles above Sha-sze, on the right bank, is the Tai-ping-kau, the mouth of the Tai-ping canal, which is 100 yards wide. A small village stands on the east side of the entrance. Smaller creeks, dry in winter, from above and below Sha-sze join it. It is supposed to lead in a direct course to the Tung-ting lake, the passage to which occupies five days. It is said time is saved by taking this route on the upward journey, and thus avoiding the tortuous course and strong current of the Yang-tse. Hankow may be reached from Kin-chau fu by five days' travelling on horseback, the distance being 100 miles west, as the crow flies.

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* *See* Plan of Sha-sze on Admiralty Chart :—Plans and Ports of the Upper Yangtse kiang, No. 115; scale, $m = 2$ inches.

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Below Sha-sze the soundings in the channel were never under 4 fathoms in June, and from that depth to 17, and near the steep banks seldom less than 3; but a continuous line of soundings was never obtained by Captain Blakiston's party.

SHA-SZE TO CHI-KIANG.—There are several shoals off the sandy point opposite Sha-sze, and a sand-bank in the river just below the Taiping canal, awash in April, and the chart shows irregular soundings of 2 to 7 fathoms near the steep north bank. The best course would seem to be: keep the north shore past Sha-sze, and after passing a small ruined fort (with a 2-storied pagoda built in it), and then a creek, cross the channel S.W. by W. for the white house at the entrance to the Taiping canal; when the houses and point at the entrance are reached, steer out in mid-channel to avoid a shoal above the entrance, gaining the right bank again below the entrance to the shallow swamp, and keeping close round the bend into Sandford reach.

Sandford reach.—Haul out from the right bank after passing a kiln below the small creek, but not keeping as far out as mid-channel, as large dry shoals off the left bank extend through the reach. Close the right bank again at the entrance to the lagoon, hauling out gradually at the upper point, crossing the river about N.N.W.; passing the sand and shingle banks about 200 yards distant. There is a bar of 10 feet across the river, abreast the large house, at the north end of the sand-spit. The right bank is shoal after passing the north point of the lagoon all through this reach.

Boone reach.—There are 4 and 5 fathoms along the right bank of this reach until approaching a large joss-house on a mound, surrounded by dark trees, when cross the river W. by N. ½ N. The dry shoals in mid-channel below this crossing extend nearly up to it, with a junk channel to Kiang-kau on the north bank. After crossing keep the left bank close on board, until near the first temple (there being two just below Tungtsze), when haul out from it S.W. by S., keeping the wooded end of Pa-chow island a little on the port bow. After passing the end of the island, steer across the river gradually for a clump of straight trees on the left bank. The bottom here is loose shingle and very bad holding ground, the anchors dragging with a light wind.

Spring reach.—There is a shoal of 9 feet on the left bank below the white house marked on the chart, it commences abreast a tall tree standing over a small joss-house. Outside the shoal there is a channel of 1¾ fathoms, but it is narrow, and the current was running at the rate of 2½ to 3½ knots an hour while the *Kestrel* was on the bank in February 1877. Abreast the white house there is an extensive shoal, dry, with 4 fathoms between it and the bank. It is most probable that the sand-

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bank marked on the chart below Grant point has shifted lower down since the survey, and that the crossing is above the sand-bank.

Keep along the cliffs round the bend westward, and south of Hope island, 2 miles in length, which has a shoal off its west point, above which is the village of Yang-chi, where limestone is quarried and burnt, and red bricks and tiles are made.

CHI-KIANG.—North-west 3 miles from Yang-chi, also on the right bank, is Chi-kiang hien (220 miles), a walled city with an imposing river front. The mountain floods are felt here; one occurred in 1860, when the river rose 50 feet in the Ichang gorge, and did much damage to this town. From Chi-kiang, the course up Itu reach is North, inclining to the eastward, but after a 5 miles' run it curves by a detour of 5 miles to the westward and up to the city of Itu. At 3 miles above Chi-kiang there is a shoal near the left bank, opposite where the hills come down to the river, with a tall pagoda, having a bush growing on its side, bearing W. by N.; this shoal shows even in June, and is passed when Bush pagoda bears West. Above this, after passing the village of Pan-yang, the left bank must be kept round the bend, until more than a mile beyond the village of Pih-yang, above Keppel point, after which steer mid-channel up to Itu.

ITU HIEN (232 miles), a walled city, is on the right bank of the river, at the junction of the Chin (or Tsing) kiang, a stream about 120 miles in length (as delineated on the maps), flowing through a mountainous region; it showed no signs of trade. A little above the mouth of the Chin kiang and abreast Opossum point opposite, is a large shoal, covered in June, the eastern edge of which is in mid-channel, and the passage between it and the point. From this the course up the river is nearly North for 2½ miles, after which it is about N.W. by N. for 16 miles to the city of Ichang, through a reach almost straight. On either hand the banks become high and precipitous, bold cliffs of conglomerate and sandstone rising immediately from deep water. To the west is an entirely mountainous country, which stretches to the northward beyond Ichang, behind which the country rises gently into plateaux and ridges, occasionally broken by narrow rice-planted valleys. The country everywhere, except where impracticable, is highly cultivated.

Above Opossum point keep the bight, but when well past the shoal point north of it, cross over towards the first low hills on the right bank, and when past Hung-wha-taou recross gradually to avoid the shoals off a mountain gorge 2 miles above that village. At 4 miles below Ichang and E.N.E. of a monastery on a commanding position a mile back from the river, and 1,233 feet high; is the tail of Swain bank or island, 2 miles in length, the channel being north of it. This bank is variable in height

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and size, being 9 feet above water in April and sometimes the same in June; a seven-storied pagoda is abreast the upper part of it.

The river below Ichang is half a mile wide, and the depth varies from 4 to 7 fathoms (April 1st), with a moderate current. On the 18th of June the water was 15 feet higher. This gives the rise at 1½ feet per week, which is precisely the same as computed for Yohchau. Above Itu, the sand-banks in the bed of the river are not so numerous as lower down, and they become clayey and gravelly, with rocks in some places standing out from the shore.

ICHANG FU.—Treaty Port * (250 miles) stands on a bluff point of the Yangtse on its left bank, a small branch of the river forming an island immediately above the walled part of the town. The water is shoal off the city side, the main lead of the river being nearer to the other shore. The country to the east and south-east is broken into small hills and ridges, on which clumps of pine are dotted about, and much ground about the city is appropriated to graves.

Ichang † in lat. 30° 44′ N., long. 111° 19′ E., is by the river 365 miles above Hankow, or 950 total distance from Shanghai. For steamers of the present build in China, it must be considered as the head of the navigation of the Yangtse. It is a provincial town of the first order, and contains a considerable population. The trade in 1882 amounted to 460,443*l.*; as at Sha-ze, part of the Sz'chuen produce is here trans-shipped. An immense number of junks are moored along the shore. There entered and cleared in 1882, 25 steamers and 110 sailing vessels, all Chinese owned.

Coal exists all over the district of Ichang, it is plentiful at Kwei, 40 miles above Ichang, whence it is brought in six hours by boat, but it does not appear to be of good quality; it is small and dull looking, and is made into bricks, as in the north, before being used for fuel. Still higher up the river there is a district from which both coal and coke (which is made there) could be brought to Ichang by country boats in eight days; this latter coal seems to be of superior quality.

CURRENTS, RISE, and FLOODS.—The force of the current is very variable, but seldom sluggish. In June, for 30 miles below Ichang it was four knots, but lower down much less; in April its rate from the Tung-ting junction upwards was from 2½ to 3 knots. This part of the river is subject to extraordinary floods; in 1860, the water rose 20 feet above the level of 1861. At the Tung-ting outlet it rose 20 feet

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* Much of the information respecting Ichang and the rapids and river above the port is derived from the report of Consul C. Gardner, 1883.

† *See* Ichang on Admiralty Chart:—Plans and Ports of the Upper Yangtse kiang, No. 115; scale, *m* = 2 inches.

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between the 17th of March and the 25th of June ; and at Ichang, between the 1st of April and the middle of June, 15 feet.

Its rise in June is sometimes probably from 50 to 60 feet higher than in the cold months, judging from the height at which water lines were observed in the gorges, but much of course depends on the width of the river and the nature of the banks ; yet this estimate will not appear so much when it is considered the river at Hankow is a mile in breadth, yet rises sometimes 50 feet. The river begins to rise in the beginning * of April and rises until June, remaining at about the same level until the end of September ; and is at its lowest in the month of December, when the water loses its usual red mud colour, and becomes clear.

Now that the port of Ichang is opened, the actual time of the Upper Yangtse commencing to rise may be obtained. While the *Kestrel* was at Sunday island, Stokes channel, the following rise and fall of the river was observed: From 27th to 31st March a fall of 8 inches ; from 31st March to 2nd April a rise of 20 inches.

The water was reported not to have risen at Sunday island until 31st March, but it appeared to have risen slightly below the Tunting junction.

Pilots.—There are no licensed pilots for the Upper Yangtse ; there are, however, usually a number of junk pilots out of employ who know the river well, *but are unused to handling steam vessels ;* such pilots can be obtained by applying to the compradores.

WEATHER.—The prevailing winds during the latter part of March were north-easterly, and the weather variable with some rain as might be expected at the season of the equinox. The temperature ranged from 47° to 64°.

ICHANG FU TO KWEI-CHAU FU.

The navigation above Ichang is closed to all but tow boats, both on account of the obstructions caused by the rapids, and by the excessive velocity of the stream, which becomes greatly accelerated by a sudden contraction to half its former breadth. Capt. Blakiston found it to average 6 knots, whilst many of the rapids ran 10 in June. In April, Lieut. Dawson, R.N., estimated its strength at from 5 to 8 knots. As a rule there is no want of water in the rapids in April, but some of them are bad in both seasons, the Shan-tau-pien being the worst. In the high level season the appearance of the river is totally changed and rapids exist where there were

* This is two months later than at Hankow and Kiukiang, but both Capt. Blakiston and Lieut. Dawson make the same statement on native authority.

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none before, while former ones by the rise of the water become smoothed over. The river is highest in June, continuing high till October, and is at its lowest in December, when the water is said to be clear, though muddy at all other seasons.

ICHANG GORGE.—For three miles above the town of Ichang the river retains the same character as it has for some distance below, except that the right bank is high and rocky ; and in width the river has lessened nothing since dividing from the waters of the Tung-ting lake, being a good half mile across ; but suddenly, as if by magic, we lose the river, and in its stead an impetuous current comes rushing out of a long deep cleft in the mountains to the westward, not 250 yards in width, with its broken sides mounting vertically from 300 to 500 feet. This magnificent gorge is 9 miles in length, with no bottom at 10 and 15 fathoms depth.

FIRST RAPIDS.—About 6 miles above Ichang gorge, at a bend of the river, some islands of rock stand out towards the middle of the stream, and large boulders of granite line the shores, indicating an uneven bed in the river. Here, although it could hardly be called a rapid, the rush of water in June was very strong, and immediately below were strong eddies and whirls. A small village stands on the right bank just above, and less than a mile south some high peaks mark the end of a mountain range 2,000 feet high, which runs thence in a north-westerly direction nearly parallel with a short reach of the river, all along which lie heaps of granite boulders, forming small islands and promontories causing the river to narrow in some places to 150 yards. Two miles above the first rocks are the first rapids, and 3 miles above these the village of Shan-tow-pien, where the river pursuing a straight course is obstructed by a couple of dangerous rapids and runs the whole way with a very strong current, while the shores are still broken by boulders and solid rock. In a twist of the river 4 miles above Shan-tau-pien is the Ta-tung or Kwadung rapid, where a small island of rock stands in mid-stream.

LUKAN and MITAN GORGES.—Three miles above Ta-tung rapid, a precipitous range 3,000 feet high crosses the river, through which the river flows for 2 miles by the imposing gorge of Lukan, the sides of which rise vertically in huge walls of rock to a prodigious height. A little above this gorge is the village of Tsing-tan and a rapid of considerable strength, and 2 miles above is the Mitan gorge which hems in the river for another couple of miles between vertical cliffs 900 feet high, whence a further 4 miles of stream very full of reefs and rocks above water, which, early in April, caused almost the whole to be a rapid, carries you up to Kwei, where are a number more reefs. There is also a pretty strong rapid when the water is high opposite the place.

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KWEI is a small walled town standing on sloping ground on the left bank, 42 miles above Ichang, but having neither trade nor anything else to give it importance. About 2 miles above, coal is worked on the hillside on the south shore of the river, and 4 miles above Kwei is the Yeh-tan rapid, where there is an islet in the centre of the river. The New-kau rapid is 5 miles farther up abreast a village with a pagoda above it on the north bank. Patung, 5 miles above this, the last town in the province of Hupeh, is a small place without a wall, situated on rather steep sloping ground on the south bank, and on the opposite side stands a joss-house at a considerable height above the river.

WUSHAN GORGE.—Six miles above Patung after passing one rapid, the mouth of a gorge is entered, between high precipitous mountains on either hand, where are situated the rapid and village of Kwan-du-kow. This gorge, the longest on the river, is continuous as far as the city of Wushan, a distance of 23 miles. This is a walled town on the north bank the first met in Sz'chuan, and a small tributary flows into the Yangtse on its east side.

The following is extracted from the report of Consul C. Gardner on the Treaty Port of Ichang, 1883.

"Hearing that winter was the best time for inspecting the waters of the Upper Yangtse in order to ascertain the possibility of a steamer reaching Chungking, I started on the 17th February 1883, in a native boat with the intention of proceeding as far as Kweichow in Sz'chuan.

"My reason for limiting the journey to Kweichow in Sz'chuan was that all authorities agree in declaring that the most difficult part of navigation occurs between Ichang and Kweichow, and that from thence to Chungking is comparatively easy. Ichang to Chungking is 430 miles; Ichang to Kweichow in Sz'chuan is 100 miles; Ichang to Kweichow in Hupei is 44 miles. The worst rapids are the Yehtan and Sintan rapids, which are only a few miles apart, the former a few miles above Kweichow in Hupei, the latter some 5 miles below.

"We anchored in the Ichang gorge, 8 miles above Ichang, on the 17th. On the 18th we passed through the gorge under sail, for the water there was comparatively slack; we also sailed over the place where the first rapid is marked on the chart, but where it seems there is only a rapid in summer: the current was only running three knots an hour when we crossed it. We anchored for the night 23 miles above Ichang.

"On the 19th we passed the Sant'on-ping rapids. Here on one side of the river the presence of rocks caused a not formidable rapid, where the current for some 400 yards ran at the rate of eight knots an hour; on the other side of the river there was no rapid but a swift current in a deep

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channel, running for a mile or so at the rate of six or seven knots an hour.

"On the same day we passed the spot where the Tatung rapids are marked on the charts: there were no rapids there when we passed, and not even a very swift current. We anchored for the night at the village of Sintan, some 38 miles above Ichang.

"On the 20th we had to pass two rapids, which I have since been informed are the most formidable of all the rapids between this and Chungking.

"The danger does not consist so much in the swiftness of the current as in the presence of rocks, making the channel extremely narrow, forming at this season of the year an insurmountable barrier for vessels drawing over 4 feet of water, and causing whirlpools and backwash, perilous to the ordinary crank native craft, but which the well-built official boats face without fear.

"Over these rapids the native boats are dragged by trackers; the distance these trackers are by the nature of the ground, bound to be from the boats causes them to be out of sight of the boat and out of hearing of the master and beyond his control. Notwithstanding a system of signalling by gongs, these trackers, numbering from 50 to 200, pull blindly on and often upset the boat they track or break her against the rocks.

"Another source of danger is the carelessness or parsimony of the boat owners, who are apt to employ worn-out tracking gear, the giving way of which is a fertile source of accidents.

"We passed the first rapid without accident, but in the second the boat I was in upset, and in a few moments went to pieces. Fortunately, no lives were lost. One of the boats belonging to the lifeboat service, so admirably disciplined by Ho Ting Shen, the Naval Commandant here, came to our assistance and saved us all. The loss of all our clothes, stores, bedding, and money obliged us to return to Ichang, in doing which we were assisted by Lieutenant Chou Chêng-tuan (a subordinate of Ho Ting Shên), who treated us with great kindness, lending us money, clothes, and bedding, and sending us to Ichang by the lifeboat that had saved us.

"Since my return I have been informed that the Sintan rapids are most dangerous at dead low-water and after continuous rains; both these conditions were fulfilled when we attempted to go up them. They and the Yeh rapids are the Scylla and Charibdis of the Upper Yangtse—the Sintan being comparatively safe at high water, and the Yeh being then most dangerous. At the Yeh rapid the whole river is narrowed, and rushes through two rocks at a tremendous velocity; a traveller who passed it this May reckoned the current then ran there eleven knots an hour. Though

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more formidable in appearance than the Sintan rapid, it is not really so dangerous.

A very noticeable feature of the waters of the Upper Yangtse is, that the swiftness of the stream and the danger of the rapids varies from hour to hour and day to day. In summer there are slack and safe times. In winter there are swift and dangerous times. As a rule navigation by native boats is far easier in winter than in summer, and there are days in summer during the freshets when no navigation whatever would be possible."

WUSHAN to KWEI CHAU FU.—Three miles above Wushan is the Hea-ma rapid, above which the river is clear for 10 miles, to the entrance of another gorge known as the Fung-siang or Wind-box. At its lower entrance is a rock, awash (April) in mid-channel, and a sand-bank off a mountain stream on the south side. One part of the pass is not over 150 yards wide, and the cliffs tower to a prodigious height. An isolated rock stands out nearly mid-stream; and on emerging from the gorge a tall white pagoda comes in view, and Kwei-chau is seen 3 miles above.

At Kwei-chow fu the Admiralty survey terminates, the explorations* of Capt. Blakiston and Colonel Sarel extend 500 miles beyond into the remote parts of the province of Sz'chuan, 1,570 miles from the sea, but the river above Kwei-chow has no nautical interest as it is not navigable even by small steam vessels. The principal towns they visited are Wan hien 57 miles, Chung-king fu 256 miles, Siu-chau fu 458 miles, and Pingshan, their farthest, 496 miles above Kwei-chau fu.

Exploration of 1869.—A narrative of the proceedings of the Special Commission to examine the Yangtse as high as Chung-king fu, in 1869, conducted by R. Swinhoe, Esq., H.M. Consul, is published (with map) in the Journal of the Royal Geographical Society, Vol. XL. for 1870, page 268.

With reference to the navigability of the river above Ichang, Mr. L. S. Dawson, R.N., who accompanied this expedition as naval surveyor, writes :—" The part of the river between Ichang and Kwei-chow-fu was particularly examined, more especially in the vicinity of the rapids, and I regret to have to give it as my opinion that steam navigation cannot be carried on above Ichang. The force of the current, want of anchoring ground, intricacy of navigation, and changeable condition of the river's bed, are, I consider, sufficient reasons to preclude the possibility of anything beyond a native junk being able to ascend these rapids. The descent would be, if anything, more difficult, as, should a vessel fail to answer her helm at the exact moment, nothing could prevent her being dashed upon the rocks.

* Five months on the Yangtse by Capt. Blakiston, RA.

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"To make a proper survey of these rapids would be at any time a matter of much danger, if not of sheer impossibility, as I found on making the attempt in a boat with ten rowers that she was altogether at the mercy of the current, and the chance of swamping or striking a rock more than probable; this was in April, and, from what information could be gleaned from the natives, the most favourable period of the year. From the appearance of what would become the river's bed in summer, then some 30 feet dry, the rapids must increase in danger and violence, inasmuch as even junks have to tranship their cargoes. On the downward return journey by junk a line of soundings was obtained mid-channel, the depth of water in the gorges above Ichang, generally, being found to be over 20 fathoms, rocky bottom. In one gorge 44 fathoms were obtained. The various dangers are most abrupt, the lead giving no warning. No opportunity was lost of testing the velocity of the current, although in the immediate vicinity of the rapids this had to be estimated, owing to the junk being tracked up close to the shore, where the force of the current was not so much felt. The river between Ichang and Yoh-chau is of similar nature to that below Hankow, and quite as navigable for vessels of 7 feet draught from the beginning of April to the end of September. Local reports as to the fall of the river in these parts were so unsatisfactory that although, on the whole, they tend to the conclusion that the river was at its lowest in April, still, without actual observation or better authority, such statements must be received as doubtful. This part of the river is subject to more changes than the river below Hankow, but not beyond what a pilot's experience could keep pace with. The general rule for navigating the river is to hug the steep bank, but the formation of the banks and difference of depth on either side, as shown by the lead, are of great assistance."—Extract from the Report of Mr. L. S. Dawson, R.N.

Lieutenant Commander Stokes, R.N., of H.M.S. *Opossum*, who conveyed the Commission to Kwei-chau, was of opinion that the river rose 60 to 80 feet in the gorges, and that the velocity of the stream at the rapids was 8 to 10 knots. The passages through the rapids were narrow, uneven, and rocky, with large rocks and boulders on either side. Both above and below the rapids were frightful eddies and whirlpools. Several of the large junks are lost by striking rocks when crossing the rapids. No anchorage was observed for a ship in the river, the junks, when they wish to stop, making fast either to rocks, or piles which they drive into the shore. In some places the river is exceedingly tortuous, with a width of only about 80 to 100 yards.

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CHAPTER IX.

COAST OF CHINA FROM THE YANGTSE KIANG TO PE-CHILI STRAIT.

INCLUDING THE EASTERN AND YELLOW SEAS, SHANTUNG PROMONTORY, YELLOW RIVER, THE TREATY PORT OF CHIFU, PE-CHILI STRAIT AND THE SOUTH COAST OF LIAU-TUNG.

VARIATION IN 1884.

Yangtse Kiang Entrance, 2° 20′ W. | Pe-chili Strait, 3° 40′ W.

The TUNG-HAI, or Eastern Sea of the Chinese, although recognized by geographers, is scarcely known by that name to navigators. It comprises the space lying between the Yellow sea and the Pacific, being separated from the former by an imaginary line joining the mouth of the Yangtse and the Korea, and from the latter by the chain of islands stretching from Kiusiu (Japan) to Lu-chu and Formosa. Its climate is temperate, though subject to gales, and occasionally to typhoons, and snow storms in winter; the summer season is fine. Its currents, beyond the influence of the Yangtse and coast tides, seem to be irregular, except in its eastern part, through which the Japan stream flows north-eastward from Formosa towards the Pacific along the southern shores of Japan, and northward with some regularity, especially in the summer season, through Korea strait.*

The WHANG HAI, or Yellow Sea, is bounded on the west by the deep bight of the coast formed between the Yangtse and the Shantung promontory, and on the east by the coast of Korea. It is mostly muddy and of a yellow colour in its southern part, even far out from the estuary of the Yangtse, its discoloration being due to the mud brought down by that and the Yellow river, from which latter it formerly derived† its name; but north of this river the sea water is clear, and known to the junkmen as the Black-water ocean.

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* *See* Admiralty Chart :—China, from Hong Kong to Liau-tung, No. 1,262; scale, d = 2 inches.

† Of late years the Yellow river has discharged itself into the gulf of Pe-chili.

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This sea was little frequented by foreign vessels previous to 1858, but since that year all the prominent features of its coast have been surveyed or examined, and the dangers of it are now sufficiently well known, to answer the requirements of safe navigation between the treaty ports of China and Japan.

WINDS and WEATHER.—The climates of the Eastern and Yellow seas are in most respects identical, although there is considerable variation between their remote extremes, viz., the region about Formosa and Lu-chu in the one, and that of the coast of Shantung in the other.

In the Yellow sea, near the coasts, the winds throughout the greater part of the year are local. Between Shanghai and the Korea, and almost embracing the Shantung promontory, in December and January, it blows almost constantly from the north-west, (seldom ranging beyond North and W.S.W.,) with gales of long duration from North to N.W., sometimes with fine, but generally with overcast, gloomy weather attended with rain. Towards the China coast the wind follows more the trend of the shore, and between Shanghai and the gulf of Pe-chili, Captain Good-enough, of H.M.S. *Renard*, which ran the mails in that season, states that a fresh N.N.E. wind blew almost incessantly until the end of February, when it vecred more to the eastward.

There are, however, breaks in this regularity ; December 1861 set in with a N.W. gale which continued a week, succeeded by a South gale veering to West and returning to the former quarter, after which the wind was variable until the 16th, but chiefly fine, when N.E. winds set in, threatening snow. Snow is rare at Shanghai, but the mountains and coasts of Shantung and the Korea are covered with it in January, February, and part of March, and high lands remain covered later.

In the Eastern sea.—In the spring and until June, moderate winds from East prevail, bringing rain and drizzle, generally when the wind veers a little to the northward, also occasional stiff N.E. breezes ; S.W. winds occur but rarely, but bring fine weather for short intervals. Later in the season the winds are variable, inclining chiefly to S.E., with occasional N.W. breezes. Towards Japan it is recorded that westerly winds prevailed at the end of July. Early in September, the winds prevail between E.N.E. and South, and strong East gales have been known, but are very unusual.

On the Shantung coast the wind during the spring and summer months is variable and there is but little rain. In May the wind was N.W. to N.E. 9 days ; East to S.E. 7 days ; South to S.W. 10 days ; West, calm, and variable 5 days. There was fog on 7 days, and rain

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on 5 days. East winds brought rain and gloomy weather; southerly winds the fog. After May the winds along the coast became more variable (chiefly south-easterly), light easterly winds prevailing with very dry weather, gales or strong winds being of rare occurrence, and those lasting but a few hours, seldom twelve. Sudden and heavy squalls and thunderstorms also occur in the summer months. A sudden fall of the barometer with the wind easterly is almost sure to be followed by a short gale, sometimes not commencing till the barometer has risen considerably.

TIDES and CURRENTS.—The tidal wave appears to come in to the Yellow sea from the south-eastward in the form of a tongue, making high water at the Shantung promontory only 2 hours later than at Gutzlaff island, although it is several hours later on the intermediate coasts. The rise at Gutzlaff is 15 feet, but at the promontory only 6 feet; whilst opposite on the Korean coast it rises to 20, and in one place even 36 feet; a phenomenon almost exactly similar to that which occurs in the English and Irish channels.

The flood sets West, and the ebb East, along the Shantung coast, to within 100 miles of the ancient or southern outlet of the Yellow river; but the rotatory tides of the Yangtse have been observed off shore, 120 miles north of the latter. In lat. 30° 15′ N., long. 122° 16′ E., 70 miles from the coast, and 127 miles North (true) of the Ariadne rock, it was high water, full and change, about 1 o'clock, and the rise and fall about 9 feet. During the whole rise and fall of the afternoon tide, it set from N.N.W. to N.N.E. at a maximum of nearly 2 knots, and being nearly slack for 2 hours; and during the whole a.m. rise and fall, it set weakly to the southward for 13 hours; making one complete revolution in 24 hours. These tides were observed in December, and are recorded chiefly with the hope that more light may be thrown upon them by others. A stiff S.W. wind was blowing at the time, which may account for the weakness of the southerly current, as it is well known that in the northerly monsoon the southerly set predominates.

PASSAGE between SHANGHAI and JAPAN.—Sailing vessels bound from Shanghai to Hakodadi or to Nagasaki (Japan), in May and June, should endeavour to make as much easting as possible, as they are liable by standing long on the starboard tack to be set to the northward amongst the Korean groups by the prevailing easterly winds. By making a landfall about the south part of Kiusiu, they will sometimes have the assistance of that arm of the Japan stream which sets to the northward by the Korea strait.

If bound southward from the above ports in the winter months, it should be recollected that a continuance of north-westerly winds may set a vessel

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to leeward of Video, as happened to H.M. surveying vessels *Actæon* and *Dove* in December 1859, on their passage from Tsu sima to Shanghai. If bound from the gulf of Pe-chili to Shanghai in the northerly monsoon, care must be taken not to overrun the distance (see p. 431).

The YELLOW RIVER or WHANG HO*, is little inferior to the Yang-tse in magnitude, being nearly 2,500 miles in length, but beyond 250 miles from the sea it is totally unnavigable, and is alike, at present, the most useless and impracticable river in the world. Flowing through the midst of a densely peopled and highly cultivated country, this remarkable river offers no facilities for navigation throughout a great extent of its course, and it has gained the apt and striking name of "China's Sorrow," on account of the exposure of the Great plain (which its lower course traverses) to disastrous inundations, which are a perpetual source of wasteful expenditure to the government and of peril and calamity to the people.

In the lower part of its course from the cities of Hwai-king and Kai-fong to the sea, a distance of 350 miles, this great river has no permanent bed,† alternately changing its direction through the Great plain, north or south of the mountains of Shantung, and has for ages been dependent on the exertions of the government in keeping it within vast embankments, to prevent the periodic desolation of a province by its inundations; the most terrible of these occurred in 1642, when the city of Kai-fong was submerged 20 feet, and 200,000 persons are said to have perished.

The source of the Yellow river is in the region of the Ko-ko-nor, on the eastern borders of Tibet, and close to the upper waters of the Yang-tse kiang. On the northern side of the mountain range of the Bayankara, in lat. 35° N., long. 96° E., beyond the frontier of Sz'chuen, a number of springs or lakelets, in a plain called Sing-su-hai or Sea of Constellations, unite in two larger ones called Ala-nor. From these the river winds in a most crooked course for 300 miles about the gorges of the mountains, and then runs north-east and east to Lan-chu fu in Kansuh, having flowed about 700 miles in its devious course.

Thence turning north-north-east for 400 miles (250 of which is along the Great wall), the river bends eastward by the Inshan range, along the edge of the table-land of Mongolia, for 200 miles, when, in long. 110° E., it is deflected to the south for 400 miles, forming a rectangular bend, at the northern part of which, for more than 500 miles, it receives not a single

* Williams's *Middle Kingdom*, Vol. I., p. 16.

† *See* note on next page.

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stream of any size, while it is still so large and rapid in Shansi as to demand great precaution when crossing it in boats.

The river then enters the Great plain, 1,100 miles below Lan-chu fu. In this part of its course it becomes tinged with the clay which imparts to it both name and colour. At the south-western part of Shansi it receives its largest tributary, the river Wei, which comes in from the westward after a course of 400 miles, and which is more available, as far as means of navigation are now had amongst the Chinese, than the whole of its mighty competitor. From this angular turn the parent river flows eastward to the sea for 600 miles, being in some parts of Honan above the plain on its sides, and finally disembogues in about lat. 34° N.,* bearing the character of a mighty, impracticable, turbid, furious stream throughout most of its long route.

The area of its basin is estimated at 700,000 square miles,—about the same as that of the Yang-tse. It is but little used by the Chinese for navigation, and the cities on its banks are in constant jeopardy of being submerged. Foreign skill and science are necessary to teach the people how to restrain its fury, and western steamers alone can stem its impetuous current and make it a channel for commerce. In its progress the Yellow river receives fewer important tributaries than any other large river in the world, except the Nile; the principal being the Wei and Lu in Shansi, and the waters of lake Hong-tse in Kiang-su.

SAND-BANKS NORTH of the YANG-TSE.—The coast for the 150 miles between the entrances of the Yangtse and Yellow rivers is low, and intersected by numerous streams. The Grand canal connects the two rivers at their nearest point of approach to each other, where they are only 75 miles apart. The canal is raised considerably above the plain at Whai-ngan on the Yellow river, a little below the Hung-tse lake, and 45 miles above the river's mouth, and thence falls to the level of the Yang-tse at Chin-kiang fu.

The whole of this low coast is fronted by extensive flats and shoal banks, projecting in some places above 60 miles from the land,† and rendering the approach dangerous for vessels of large draught until better

* This refers to the southern outlet of the river, but in 1850 it burst its embankments, and the lower part of the river was diverted to the northward of the Shantung peninsula, its present outlet being the Li-tsin-ho, in lat. 38° 20′ N. The new course of the river is described on page 614.

† At about N.N.E. ½ E. 45 miles, and again at about N.E. by N. 90 miles from Shaweis-han island, H.M.S. *Fly* struck soundings, in 1881, getting in each case as little as 4½ fathoms, but there is no data accurately to fix the position.—Information derived from Navigating Officers' Remark book, H.M.S. *Fly*, 1881.

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known, although there may probably be channels among the banks in the neighbourhood of the coast frequented by the native trading vessels. They all lie west of the meridian of 122° E., except off the northern entrance of the Yang-tse and Tsung-ming. H.M.S. *Highflyer*, July 1859, had soundings of 12 fathoms, abreast of and 100 miles from the mouth of the Yellow river. These shoals are thus described in a Chinese itinerary :—

"To the north of Yushan, which is Shaweishan island, at the entrance of the Yang-tse, there are several long belts of sand, and to the westward of the same the sand-banks all assume a more compact form. They are very numerous, but the figures are various; hence the different names."

Of these belts, six are represented lying north one of the other, but gradually receding to the westward, viz. :—The Pan sha* nearest Shaweishan; then Hi-tei sha; these lie off Liau-kio-tsui, the northern cape into the river. North of these is the Liu-szi kiang, a channel having 7 to 8 fathoms at its outer part, and then the Wu-nan sha and Lankia sha, with a channel between them of 8 to 9 fathoms water: the Chin-kia lies north of these, its eastern point in 5 fathoms being probably that which is in lat. 33° N., long. 121° 55′ E.; and lastly, the smallest of these, the Hwan-tsi sha, rather to the north-west. To the north-west of these belts are nine irregular banks towards the mouth of the Yellow river, with passages marked between them and the coast, but some of them are shallow.

The TA SHA or Great sand-bank stretching off the coast to the southward of the entrance of the Yellow river, is 80 or 90 miles in length, east and west, and probably 30 miles broad. In 1861 H.M. surveying-vessel *Dove* sounded on its eastern extreme in 5 fathoms, in lat. 34° 24′ N., long. 121° 40′ E.; also in 7 fathoms 22 miles S.S.E. of the above position. The junks are said to ground frequently on this bank, from which it may be supposed there are breaks in it, which they attempt to pass through. Junks making passages always pass well outside it. There are probably channels near the shore, for many of the sand banks are named.

FOUR ISLANDS.—On various Chinese maps four hills or islands are represented at from 30 to 50 miles northward of the Yellow river entrance. Two of these were sighted by the *Dove* on making the coast in December 1861, and their positions approximately fixed. The north-eastern one is in about lat. 35° N., long. 119° 40′ E., and probably agrees with the Chinese Ying-yu-mun. It is about a mile in extent, has a flat rugged top with abrupt sides as if of sandstone formation, and is 100 or 200 feet high.

* *Sha* signifies sand, or sand bank.

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A smaller islet or rock, of conical shape, probably the Chinese Nai-nai-shan, was also seen from the mast-head, about 10 miles south-west of Ying-yu-mun. If the other two exist, they are Mun-li-shan, lying south Ying-yu-mun, and Kai-shan, south-east of it and the more distant of the two. To the south and east of Kai-shan (probably Yu-chu of the Admiralty chart), and between it and the Ta sha, many ridges of sand are delineated on a Chinese map.

The COAST north of these islands, though not steep-to, may be approached with a proper degree of caution. The water is clear (as to sedimentary matter), and the bottom gravelly to the northward of the banks above mentioned.

The southernmost point of the coast of Shantung approached by a European vessel is in lat. 35° 10′ N., long. 119° 18′ E. The shore here is low and undulating, with detached hill ranges, 1,000 to 1,500 feet high, which recede from the coast at a point 10 miles north of this, and were also seen stretching to the southward, to within 60 miles of the Yellow river. A track survey* only was made from this to Kyau-chau bay, and many of the names on the Chinese maps could not be identified.

The character of the whole of the shore, hereabouts, is generally low at the coast line, with projecting reefs; there are sandy bays between the points; and isolated hills standing on low plains, which gradually attain toward the northward the altitude of mountains.

TOWER POINT is so named from a conspicuous square tower standing on a low hill. The small town here is probably Shi-kien so or Jih-chau hien. The point is low and rocky, and two reefs extend a considerable distance off it, but they may be passed at a mile in 7 fathoms. At 4 miles south-west of the point are some earth cliffs, probably the Shan-nan tau (Hills' South head of the Chinese) lying under a sharp hill which has a tower on its eastern spur; off these cliffs an extensive reef dries out a mile, and shoal ground, 5½ fathoms, rock, was passed over at 2½ miles from the shore.

There are also reefs of considerable extent skirting the coast for 6 miles north of Tower point. About N.W. by W. 12 miles and N. by W. 6 miles from the point are two conspicuous isolated hills, 6 miles apart, respectively 1,000 and 800 feet in height; that nearest the coast, slopes towards the sea, and terminates eastward in a bluff, which is the southern point of entrance of a large open bay 9 miles across and 7 miles deep, the north-eastern point of which is low and very rocky, with an island off

* By Lieut. Chas. Bullock, R.N., 1861. The doubtful names mentioned in the following description are taken from a Chinese map, but the features of the coast line thereon are too distorted to admit their being followed accurately.

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it similar in character. West 3 miles from the latter point a reef was seen fully a mile in extent, and beyond it, under some low cliff-sided hills on the north shore of the bay, a junk anchorage, and what may have been the entrance of a river. This anchorage is the Seching-tseih of the Chinese (West city gathering), and possibly an excellent harbour.

WANG-KIA-TAI BAY.—North-east of this reef point is the anchorage of Wang-kia-tai, a long narrow bay having very shallow water; its shores are low and rocky, with long projecting reefs, and must not be approached on either side. The bay affords shelter from north and north-east winds in from 3 to 5 fathoms, mud; but it is quite exposed to the southward, and even in 2 fathoms, which is outside where the junks were lying, it is open from S.E. to S.W. There were 30 junks lying here in December 1861, but the junkmen were under no apprehension with regard to the weather, and considered the anchorage a safe one at that season. There is trade with Shanghai, but chiefly with Ningpo. Junks were lading with salted pigs, cotton, cabbages, and radishes. The temple of Lung-Wang on the shore of the bay, is in lat. 35° 39′ N., long. 119° 48′ E.

TIDES.—It is high water, full and change, in Wang-kia-tai bay, at about 6 h. 0 m.; springs rise 12 feet, neaps 9 feet. The stream during the whole ebb sets to the north-east along the coast, and the amount of tide was 6 miles. It may therefore be assumed that, as at Staunton island, the flood sets along the coast to the south-west.

LANG-YI TAU.—The shores of the headland east of Wang-kia-tai are low and rocky, except on the sea coast, where there are two hills 600 and 400 feet high (the latter or south-eastern having a nipple on it), the termination of a low range of hills. Lang-yi tau lies off shore, a mile distant from the base of the nipple-hill, and has a broad looking channel inside it, but it is apparently connected with the main by a spit, which runs off from the low inshore or north part of the island; the outer or south part of the island is a bluff 200 feet high.

PINNACLE RANGE is on the coast, about 11 miles N. by E. of Lang-yi tau. It is about 1,600 feet in height, serrated at its summit, and broken in its descent to the sea into a number of remarkable, rugged hills. This broken ridge runs about S.S.E. and abuts on the sea at 4½ miles from the summit. Between this and Lang-yi tau is a large bay with sandy shores. The next 13 miles of shore to the north-eastward has not been explored, but from thence to Staunton island the coast has been regularly surveyed, commencing from the cape northward of Tolosan. Pinnacle range would appear to be the Chinese Lingshan.

TO-LO-SAN is an island 2½ miles in extent, north and south, lying about N.E. by E. 15 miles from Lang-yi-tau. It is a mountain ridge, the

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southern part of which rises to an elevation of 1,700 feet, and is precipitous, but slopes away towards its northern point, off which is a small low island. Its position on the chart is pretty accurate.

TANG-TAU is a peninsula forming the south boundary of Kyau-chau bay. From cape Evelyn, its north point, it extends south-westward about 11 miles, and the shore appears to be bordered by long reefs, with depths of 6 to 8 fathoms at a quarter of a mile. There is said to be a group of unexplored islands about its south point which is situated northward from To-lo-san island and, south-westward from Ta-mo-shan, a smooth outlined mountain, 2,249 feet high, which is also called High Double on account of its showing a double summit when seen from the eastward.

TCHA-LIEN-TAU, in lat. 35° 54¼′ N., long. 120°53′ E., is S.S.E. ¼ E. 16½ miles from cape Ya-tau, the nearest land, and E. by S. 19⅓ miles from Tai-kung tau off the entrance of Kyau-chau bay. The island is one mile in length N.E. and S.W. and very narrow; at its centre is a small even-topped hill, 182 feet high, and its eastern end is a detached bluff.

This island is quite different in character from Surveyor's island, described on page 545, and which lies N.E. ¼ E. 34 miles from it. In the spring and early summer dense fogs hang about these islands, even when the coast is perfectly free from them; caution, therefore, must be observed lest the tides, which are strong at springs and imperfectly understood, set the vessel out of her reckoning.

TAI-KUNG TAU is an island, 341 feet high, 10 miles E.S.E. of cape Evelyn, the south point of entrance to Kyau-chau bay, and S.W. ½ S., 16 miles from cape Ya-tau. It is of smooth and rounded outline, and from all points of view greatly resembles a haycock. W.N.W. half a mile from it is a round islet 103 feet high; and W.S.W. 6 cables from the islet is a rock which covers at high water, surrounded by a reef extending 4 cables to the south-south-west, which at other times of tide is partly dry and partly awash. It is recommended to give this island a berth of 2 miles when passing westward of it.

SIAU-KUNG TAU, lying 5 miles E.N.E. from Tai-kung tau, and S.W. ¼ S. 10¼ miles from cape Ya-tau, is a large, flat, square mass of rock rising sheer from the sea to the height of 78 feet, and apparently bold-to on all sides, with 15 fathoms water at 3 cables' distance.

ROUND ISLAND, 172 feet high, lying South of the west point of entrance to Kyau-chau bay at 2 miles from the shore, is of semicircular profile, and conspicuous on that account. About a quarter of a mile west of it, and connected at low water, is aanother island, larger, but only

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100 feet high, having a level top, and inhabited. Off the east side of Round islet are two low islets.

DANGEROUS ROCK, bearing N. ¾ E. 3 miles from the summit of Round island, and S.E. ¾ S. 1¾ miles from the west entrance point of Kyau-chau bay, is just covered at high-water springs, and has deep water on all sides.

At one mile W.S.W. of it and half a mile off-shore is another rock which covers at 5 feet rise of tide. Between these two rocks there is a passage of 13 fathoms water, with the point bearing N.N.W., but it is more prudent to keep outside or eastward of Dangerous rock.

SWALLOW BANK, of 26 feet least water and half a mile in extent, lies N.E. ¾ N., 4 miles from Round island, and E.S.E. 3 miles from the west point of entrance. This bank appears to be formed by deposits from the bay. To pass north of it keep the summit of Sishan touching cape Evelyn W. by N. nearly. A good mark to lead between it and Dangerous rock, is the highest and northern summit of Chi-po-san, touching Pile point a little eastward of cape Evelyn, about N.W. by W.

WEI HAI or KYAU-CHAU BAY,* the entrance of which is on the west coast of the Yellow sea, in lat. 36° 2′ N., long. 120° 18′ E., is a spacious harbour and one of the best sheltered on the east coast of China, its area at high tide being about 140 square miles, and the anchorage perfectly landlocked. It is partially frozen over during the severe winter season, which sets in at the beginning of December and ends about March, and the inhabitants say that the ice is then firm enough to walk across from Potato island at the north part of the bay to Chi-po-san within the entrance.

There will be no difficulty in recognizing the entrance to this bay in clear weather, either when approaching from north or south, for at 17 miles eastward of it, the Loshan mountain, which is 3,530 feet high and extends north almost the same height for a mile, forms an unmistakable landmark. On a nearer approach the rugged top of the Lungshan mountain, 1,146 feet high, will appear as a prominent and singular feature, and a little farther westward and immediately over the north side of entrance is Nubble hill, 490 feet high, with a large stone on its summit. At 11 miles westward of the entrance, the Tamo-shan or High Double mountain, of smooth outline, rises to the height of 2,249 feet, and is very conspicuous, showing a double summit from the eastward; this range runs north and meets the summit of Sishan, a mountain 1,096 feet high.

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* *See* Admiralty Chart of Kyau-chau bay No. 857; scale, $m = 1{\cdot}3$ inches. The local name is Chiu-chu.

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The general appearance of the land about the bay is barren in the extreme, and the dry parched soil (yellowish clay interspersed with occasional blocks of granite) has a most uninviting appearance. The entrance, 1¾ miles wide, is between the bluff of cape Evelyn on the south, and a low promontory with rocky shores on the north, which terminates in a grassy island of the same character, Yu-nui-san, 30 feet high, which lies south of its western extremity. Cape Evelyn is the north extreme of a promontory extending from the southward nearly 3 miles. Immediately over the cape is Titung-shan hill, 518 feet high; south of which the hills are undulating, and the southernmost, 400 feet high, has a conical appearance from seaward.

At 3 miles W.N.W. from cape Evelyn is Chi-po-san island, which is the first low land recognized after passing the entrance. It is 2½ miles long in a N.N.E. direction, with an average breadth of three-quarters of a mile. There are several extensive villages on it, and its northern or highest hill has an elevation of 177 feet. Sishan mountain to the westward of Chi-po-san island is very conspicuous, and extending eastward from its summit for nearly 3 miles is a range of hills 700 and 800 feet high, falling abruptly on all sides. N.W. by W. 8 miles from Sishan, another range suddenly rises from the level ground, the highest hill of which, 694 feet elevation, has the appearance of a saddle.

The actual head of the bay, which is its north-western part, has no distinguishing feature, and the almost level land, about 180 feet high, is faced by extensive mud flats, which dry out nearly 3 miles from the shore. Potato island, forming the northern boundary of the bay, is about 4 miles in extent east and west, and the same north and south, having its greatest elevation near the centre, which is about 200 feet high. Its south-eastern part is the Ting-ge-san promontory, the summit of which, 176 feet high, and immediately over the east extreme, is easily recognized.

On the eastern side of the bay, 6 miles inland, is the Tung-lau-shan mountain, 1,924 feet high, which from its singular formation has a most striking appearance, the summit, as its name indicates, greatly resembling a tower. Gau-shan or Harbour Hill, 333 feet high, on the eastern shore of the bay, and 6 miles inland, is connected with the rugged range of Lungshan to the south-east by an almost level ridge 350 feet high.

Bay Rock, covering at 3 feet rise of tide, lies W. by N. ½ N. 1½ miles from cape Evelyn, and S.W. ¾ W. nearly 2 miles from the south point of Yu-nui-san. This rock may almost be called a hidden danger, as it is covered at low-water neaps. To pass north of it, keep Tai-kung-tau well open of cape Evelyn.

Horse Shoe Rock is the most off-lying danger on the east shore of the bay, from which it is distant half a mile. It covers at 5 feet rise of

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tide, and from its north-west horn the west extreme of Yu-nui-san bears S. by W. ½ W. 2 miles, and the summit of Chi-po-san W.S.W. 3¼ miles. The summits of Tung-lau-shan and Gau-shan in line, and open westward of Woman's island, N.E. ½ E., lead 3 cables to the westward of it.

Woman's Island, 15 feet high, and on the same shore of the bay, is nearly 2½ miles S.W. ½ W. from Gau-shan summit, and 2¾ miles N.W. ½ N. from Nubble Hill. Its north and west sides are fringed with rocks which dry at low water, and it is connected with the mainland by an extensive mud flat. At 4 cables S.W. by W. ½ W. from the centre of the island is a rock which covers at 10 feet rise of tide.

Supplies.—Almost any necessary supplies can be obtained at the village of Ching-tau-kow, which stands in a bight on the north side of entrance of Kyau-chau bay, one mile west of Nubble hill; also at Nui-tse-kow,* on the north-east shore of the bay. The third village of importance is Ta-pu-tur at the head or north-west arm of the bay, 7 miles from the nearest anchorage, and distant 8 miles from the city of Kyau-chau. Each of the above villages has a custom-house. There is a large junk trade carried on with ports to the north and south; their cargoes are principally grain, fruit, and vegetables. Ta-pu-tur is situated in a marshy plain full of lagoons, and is very unhealthy.

Clear and good water can be obtained by digging above high water mark in the sandy bay on the east side of Chi-po-san and south of its summit H.M.S. *Swallow* watered at this place during a period of two months in the summer.

TIDES.—It is high water, full and change, in Kyau-chau bay at 5 h., and springs rise 12½ feet, neaps 9 feet. The turn of the stream is very regular, taking place at high and low water by the shore, both inside the harbour and at the entrance. The direction is generally towards the mouth of the bay, and the rate 1 to 2 knots, increasing to 3 and 4 knots near the entrance, after which the rate is much diminished. There are tide ripples off Pile point eastward of cape Evelyn and also off Yu-nui-san, the north entrance point.

DIRECTIONS.—Vessels navigating in the vicinity of Kyau-chau bay may soon find shelter in heavy north-easterly gales. Having made out the land it will be best to hug the shore to insure smooth water, and if necessary, anchorage may be found in 8 to 10 fathoms, muddy bottom, anywhere between the entrance of the bay and Lo-shan harbour, which is S.W. of Lo-shan mountain. The low islet Chuen-si-san, about 15 feet high, lying three-quarters of a mile off the shore, in a S.E. direction from

* Or New-kow, the seaport of Tsi-mi, a city 13 miles to the north-eastward, about 4 miles from the head of the southern head of Lo-shan bay.

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the summit of the Lung-shan mountain, and 8 miles eastward of the entrance, should always be left to the northward.

The first anchorage where junks resort is S.E. 2 miles from Tungshan on the north side of the entrance in Ching-tau-kau bay. Small vessels can anchor amongst the junks, but vessels of large draught should anchor in 8 or 9 fathoms, muddy bottom, with the small island on the east side of the bay bearing about N.N.E. one third of a mile.

The large bay on the south side within the entrance, between cape Evelyn and Chi-po-san island, which might be considered an outer harbour, affords excellent shelter from easterly winds, round south to N.W. Si-ot-su-shan hill, 359 feet high, is over a point which extends to the north-east and divides this bay into two smaller ones, both affording good anchorage for small vessels in 2 to 3 fathoms. In the eastern of these bays is a rock which covers at 8 feet rise; it lies S.E. by S. three-quarters of a mile from the extreme point of Si-ot-su-shan, 4 cables off the middle point of the bay, between which and the rock is a passage of 2 fathoms water. Bay rock described above, is in the very centre of this bay.

The *Swallow* rode out several heavy gales from North round to N.E., about three-quarters of a mile to the north-west of Bay rock, with the summit of Chi-po-san bearing N.W. by N., in 9 fathoms, mud. As the water at this position shoals suddenly, it is almost impossible to drag the anchor, but a vessel is liable to part her cable, as the sea has 10 miles drift from the northward. This cannot therefore be recommended as a good anchorage in the winter months, owing to the prevalence of northerly winds. If a vessel wishes to proceed farther into Kyau-chau bay, the points of entrance just shut in S.S.E. is a good mark to steer by. There are numerous shoals about the bay, which would necessitate much caution if proceeding up the bay without a chart, but as a rule it is recommended to anchor eastward of the junks, as they are generally on the edge of shoal water. Small rivers fall into both arms of the bay.

Kyau-chu or Glue city, the local name of which is Chiu-chu fu, stands at the north-west part of the western arm of the bay, about 8 miles above the entrance of a small river (where stands a village with custom house), and was formerly the principal emporium in the east of Shantung. Teih-mei-heen (Tsi-mi) or Black Ink city, about 28 miles to the eastward, and on the bank of the small river which runs into the north of the eastern arm of the bay, at the mouth of which is New-kau, its seaport, is said also to be a place of considerable trade.

CHING-TAU-KAU, already mentioned as a place where supplies may be procured, stands on the bay at the north side of the entrance to Kyau-chau. It consists of a few houses only, with a large sandy basin in the middle, where large numbers of pigs are slaughtered and cleaned

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for salting. It has a brisk and not inconsiderable trade with Shanghai. At the time of the visit of H.M.S *Dove* in December 1861, there were not less than 80 junks loading and discharging their cargoes. Salted pigs and Shantung cabbages are the chief articles of export, also radishes, ground nuts and cotton. Fire-wood and charcoal are very scarce on this part of the coast; the former was obtained at 6½ dollars a ton, the latter of excellent quality at 30 dollars. Fresh water is brought off in regular water boats, which supply the junks.

Anchorage.—Ching-tau bay is open to the south and south-east, but a small rocky island in the bay gives some security in a sort of inner harbour, where, lying in 1 to 3 fathoms water, junks obtain shelter in southerly winds. In December 1861 this bay was so crowded with junks, that the *Dove* was obliged to anchor in 9 fathoms outside them in the roads, nearly 1½ miles from the town, where a heavy ground swell rolled in from seaward, although the wind was off shore, and from north-east.

This anchorage is probably a safe one at all seasons, as the wind rarely, (it was stated) if ever, blows strong from south-east or south; but from these winds, except in Kyau-chau bay, there is no part of the coast where shelter can be obtained. During the summer months, however, winds from E.N.E. to S.E. are very frequent, at times blowing a hard gale.

The COAST, eastward of Kyau-chau bay which extends W. by N. 22 miles and terminates in cape Ya-tau, is the southern face of a mountainous peninsula which is indented with several bays and has many off-lying islands and reefs, but there is anchorage all along at a moderate distance from the shore, the soundings for the most part decreasing gradually. In one of the bays is the town of Fushan which is probably identical with Loshan harbour described below.

RED ROCK, so called from its appearance, 34 feet high and a cable in extent, is N. ⅓ E. 5 miles from Siau-kung tau, and W.S.W. 7 miles from cape Ya-tau. On all sides of it are depths of 8 to 10 fathoms within a cable. It marks the entrance to Loshan harbour which is directly westward of it.

LOSHAN HARBOUR, is 14 miles from the entrance of Kyau-chau bay and 8 miles from cape Ya-tau. It is one mile wide at entrance where is 4 fathoms, gradually decreasing towards the north-western part of the bay, but towards the north-eastern inlet there is a deep hole of 10 fathoms abreast the passage north of Fau-tau tau inside which it suddenly shoals to 2 fathoms.

Fau-tau tau, 258 feet high, and forming the eastern side of the harbour, is an island half a mile north of Red rock; close off its north-west side is a small round islet, 15 feet high. Fau-tau tau is separated from a steep

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promontory, projecting considerably from the coast, by a 7-fathoms channel, 1½ cables wide.

Fort point on the west of the harbour, is 199 feet high, and extending S.E. by E. half a cable from it is a reef partially dry at low water. It is the eastern termination of a high range of hills falling from an elevation of 1,253 feet, and at the back of it, about N.W. 1½ miles, is Horn hill which is very conspicuous when seen clear of the high land on account of its singularly sharp top.

The head of the harbour is divided by a bold projecting point, 258 feet high, and on each side are conspicuous sandy bays which are very shoal, the north-eastern drying out one mile.

The harbour may be entered by the narrow channel between Fau-tau tau and the promontory, but the tides at springs are probably rapid, also between Red rock and Fau-tau tau where the depths are 17 to 20 fathoms. Entering from the southward, the reef off Fort point may be well cleared by keeping the middle point of the bay northward of N.N.E., on which course the water will be found to shoal gradually, and if Red rock be kept open of Fau-tau tau the deep 10-fathoms gulley may be avoided, although it affords good and secure anchorage with the narrow channel open east. The junks lie northward of it in 2 to 3 fathoms, good holding ground.

STEEP ISLAND, 114 feet high, is 1½ miles eastward of Fau-tau tau, and W. by S. ½ S. of cape Ya-tau; off its northern side are detached rocks which cover at high water.

LOSHAN or NIUSHAN, a lofty mountain range extending 10 miles N.N.W. and S.S.E., is the highest land on the south coast of Shantung. It is of the most rugged character of the mountain limestone, deeply indented and broken into precipitous ranges. Its highest peak, 3,565 feet high, is 3 miles from the coast whence the range runs northward the same distance with little difference of elevation. To the sea it descends in broken ridges, one peculiarly hooked peak, 1,859 feet high, being 3 miles E.S.E. of the summit.

CAPE YA-TAU (or Ya-tua), 22 miles eastward of the entrance of Kyau-chau bay, is the eastern extreme of the south-eastern ridge of Loshan, 1,165 feet in height, which when seen from the north-east or south-west makes like an island. It terminates in a perpendicular cliff about 300 feet high under a sharp well-defined hill, 747 feet high, the southern face of which is precipitous. Between Loshan harbour and cape Ya-tau, with the exception of a conspicuous sandy bay north of Steep island, the coast is bold and rugged, with 11 fathoms at a short distance from the shore. Vessels are liable to be becalmed under cape Ya-tau, even when a strong northerly wind is blowing, which comes off the

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mountain in variable flaws and squalls. There is a strong tide race off the cape.

LOSHAN BAY.—This extensive bay, 8 miles in depth, lies northeastward of Loshan mountain, its extreme points being cape Ya-tau and cape Adkins, 17 miles N.E. by N. The western side of the bay is along the base of the Loshan range, the first 6 miles of which, extending N. ½ W., are bold and rugged with small sandy bays at intervals. The northern extremity of the range terminates abruptly in a sugar-loaf hill, 858 feet high, in front of which is Centre head, a hilly promontory which divides the bay into two nearly equal parts. The depths over this great bay, except off cape Ya-tau where they deepen to 30 fathoms, are generally even, decreasing from 7 fathoms, at its outer part to 2 fathoms at about 2 miles from the northern head of the bay, where in some places the mud dries out a considerable distance; but on the west side 3 fathoms may be carried close into the shore.

Matterson Island, N.E. 7½ miles from cape Ya-tau, is the easternmost island in the bay. It is 6 cables long, north and south, and 2 cables broad, and its summit, about 200 feet high, slopes evenly to the sea on all sides, and when seen from north or south appears as a lump. There is a small reef off its northern end, but otherwise it is bold-to with 6 to 8 fathoms around.

A sunken rock of 6 feet at low water lies S.W. by W. of it, three-quarters of a mile, with a passage of 7 fathoms between it and the island; it only breaks in heavy weather.

Bobbit Island, 2 miles West of Matterson, is a mile in length north and south. The body of the island is a hill, about 300 feet high, appearing double in some directions; its northern end is narrow and low. A rock, which covers at high water, lies 3½ cables S.S.W. of its south point. There appears to be a ship passage of 5 to 7 fathoms water between Bobbit and Matterson islands, but there is a rock with less than 6 feet of water over it lying ¾ of a mile W.S.W. from the south point of the latter.

Harris and Double Islets.—Double islets, close together, the higher and western of which is 105 feet high, lie S.W. by W. 1½ miles from Bobbit. The depths about them vary from 5 to 9 fathoms, and there is a broad 6-fathoms channel between them and the shore. Harris islets are two, lying on a reef dry at low water, the eastern and larger being 100 feet high and 1½ miles West of Bobbit, with a good channel between. There is a rock which covers at 5 feet rise half a mile N.N.E. ½ E. from the larger islet.

Data Rock is 2 miles N.W. ½ N. from Harris islet. It is 5 feet above water, and apparently steep-to on all sides. There is a good channel between it and the shore.

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Bay Island, having a round summit 230 feet high, is N.N.W. ¾ W. 3¾ miles from Bobbit, and 2 miles from Village point which is the northern extreme of a small promontory, 150 to 400 feet high, 2 miles in length, north and south, and detached from the mountain range. Between them is a good channel. A small islet lies 3 cables S.S.W. of Bay island; and Neilson rock, awash at low-water springs, is N.W. by N. one mile from Bay island, with the small hill on Village point S.W.

Centre Head is nearly 3 miles northward of Bay island. The outer part is rather low, but over it rises a double-topped hill, 542 feet high, and a mile behind it a conspicuous dome-shaped hill, 780 feet high, behind which again 4 miles W.N.W., is the Sugar-loaf hill. The town of Ngan-shan-wei, or Niu-shan-wei, stands somewhere on this promontory, but appears to have little or no trade.

The deep-looking inlet, 4 miles across between Centre head and Village point, is divided into two sandy bays, and has an even bottom shoaling gradually from 4 fathoms; it is very shallow at its head, drying out between the inner points more than a mile from the shore. Centre head is bold-to, and may be approached to within half of a mile in 5 fathoms.

Northern Bay.—The land about the northern portion of Loshan bay is comparatively low, but has one hill 4 miles from its head which rises to 853 feet. The shores are generally faced by mud and rocks, drying out in some places from 1 to 2 miles. The soundings in the bay decrease gradually from 4 fathoms. There is a large flat rock, usually awash at high water, in the middle of the bay in 9 feet water, at 2 miles from the land where is a hill 330 feet high. The city of Tsi-mi is 4 miles to the north-west.

Boulder Hill, 644 feet high, a remarkable pointed hill surmounted by a mass of granite boulders, and strewed with the same some way down its sides, rises on the promontory which forms the northern point of Loshan bay. At its base the land is low and cultivated, and its shore line skirted by reefs. This hill is a singularly good landmark, presenting the same sharp form from all points of view. Its eastern extremity is cape Adkins.

Mau-tau, or Green* island, 231 feet high, is one mile S.S.W. from Boulder hill and 1½ miles W. by S. ½ S. from cape Adkins. It is connected with the shore by a stony ridge which covers at two-thirds flood; on its south side are detached rocks, which do not cover and are steep-to, having 6 fathoms within 30 yards of them.†

* This is a grassy island, green in spring and brown in winter.

† The observed latitude of the western point of Mau-tau by Commander John Ward, R.N., H.M. surveying vessel *Actæon*, is 36° 22′ 37″ N.; and its meridian distance west of Staunton island, by 10 chronometers, 1° 22′ 18″.

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Adkins Rock, 5 feet above high water, and very small, lies E. by S. from Mau-tau, and 6½ cables S. by W. from cape Adkins. It is steep-to on the outside, and may be passed at a third of a mile in 8 fathoms. Between the rock and the shore is a good* clear channel of 7 fathoms, but owing to the strong tide the water is generally discoloured.

Star Reef, one mile W.N.W. of Mau-tau, is 4 cables in extent. At high water only three rocks, near its centre, remain uncovered, one of which is 18 feet high. Between the reef and Mau-tau are depths of 3 to 5 fathoms; but between it and the shore, 5 cables N.E. by E. of Star reef, is a rock awash at low water. Between reef and rock is a 3-fathoms channel nearly 3 cables wide; inside the rock are 2 fathoms, gradually shoaling towards the shore.

A smaller reef, 2 cables in extent and covering at one quarter flood, lies S.W. ½ W. 1½ miles from Star reef. It is steep-to on all sides, and its position is generally indicated by a break. Between it and Star reef is a good and safe 5-fathoms channel. Discolored water has been noticed half a mile south of this reef, but it was well sounded over during the time of H.M.S. *Swallow's* survey, and the depths found even. Cape Adkins open of the east point of Mau-tau, E.N.E. leads outside of this spot.

ANCHORAGE in Loshan Bay.—H.M.S. *Actæon* found good shelter from N.E. winds, in 6 to 7 fathoms, with the south point of Mau-tau East (Adkins rock being a little open), and Star reef N.W. or N.N.W., but the ground was found to be very rocky, and it shoals rather suddenly to the northward.

H.M.S. *Swallow* and *Dove* found good shelter in rather less than 3 fathoms, about 3 cables northward of Star reef; at low water the reef formed a good breakwater, but at high water an unpleasant sea sometimes set in. It is an anchorage that cannot be recommended.

In the bay, westward of Star reef, are dangerous rollers even after a gale has subsided, but these were not observed along the coast under Loshan.

CAUTION.—During the summer months it would be highly imprudent to anchor on this exposed coast, with the chance of being caught in a south-east or easterly gale. In the summer of 1865 the winds from E.N.E. to S.E. were very frequent, at times blowing a hard gale, but these gales are seldom of more than 12 hours' duration. In winter the winds are from N.N.E. to N.W., chiefly in the latter quarter near the land, but in the former in the offing, although a S.W. gale of a few hours' duration, veering to south, is not unknown.

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* Lieut. Bullock stated "that towards the shore from this rock and W.N.W. of it, a "rock was seen awash." Perhaps the rock awash may be very near the shore.—Ed.

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Supplies can be obtained from any of the villages along the coast at moderate prices. Grapes and pears are cheap and plentiful. Good bread can also be procured, and late in the season hares and wild fowl may be obtained. Water is not good; in Loshan bay in August H.M.S. *Swallow* watered at a small stream north-west of Boulder hill, but the supply was poor, and it had to be carried a considerable distance in barricoes. Several cases of dysentery, one terminating fatally, were ascribed to this cause.

CAPE ADKINS, the north-eastern point of Loshan bay, is a steep, cliffy head, the smooth summit of which, 239 feet high, terminates a small range or ridge of hills running eastward of Boulder hill. On the northern part of the cape, which is rather low, is a small square tower; the southern point of the cape is an abrupt cliff, bold-to. A small round islet, connected with the mainland at low water by a spit of shingle, lies one mile N.N.E. from the cape.

KA-TIH-NIAU, an isolated island, lies off Loshan bay 12 miles E. by N. of cape Yatau, and about the same distance from cape Adkins. From the other two islands in the offing, Tcha-lien-tau and Surveyor's island, it bears respectively N. by E. ½ E. 17½ miles and W. by S. 22 miles. It is a small island, 243 feet high, with a smaller island about 100 feet high, lying 3 cables S. by W. from it, with a passage between carrying 12 fathoms.

SURVEYOR'S ISLAND, 23 miles off-shore, is in lat. 36° 16′ 30″ N., long. 121° 24′ 15″ E. It rises out of 17 fathoms water, and is divided into two distinct portions by a narrow neck which is perforated; the southern and higher part, which is very rugged, being 297 feet high. In the spring months this island is often obscured by fogs, which are very prevalent in the offing, although it may be quite clear along the coast.

CAPE ADKINS to TING-TSI HARBOUR.—The coast runs N.N.E. from cape Adkins to Ting-tsi harbour, a distance of 11 miles. The country is hilly, the shore mostly low, and not generally approachable on account of rocky and shallow ground, and it is fronted by several off-lying islands and reefs.

N.E. 2½ miles from Boulder hill, and over a point, is a smooth and somewhat flat-topped hill, 561 feet high, terminating a small range, and between the two is a group of lower and very rugged hills covered with boulders. To the northward is a deeply indented, muddy bay, almost entirely dry at low water, and at the back of it the land is low and flat across the isthmus, which divides it from Loshan bay. Rising over the bay, at 7¼ miles N.N.E. from Boulder hill, from a plain on either side, is Temple summit, 820 feet high, on which is a joss house, backed by the Kwanshan range,

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the highest point of which, Back table, is 824 feet high. On the coast, in front of Temple hill and S.E. 2 miles from it, is Yuang-shan hill, 266 feet high, which from some views shows a double summit.

Cliff Island, 121 feet high, is N.E. by E. 3 miles from cape Adkins. S.W. of it is a low island, and another of less elevation to the westward. These islands are surrounded by rugged rocks, and their northern points are connected by stony spits to a large, flat reef which dries, and this again with a low point of the shore under the smooth, flat-topped hill north-east of Boulder-hill. The outer points of these islands and Cape Adkins may be approached moderately close in 5 to 7 fathoms, mud, and there is little difference in the depth for 3 miles farther out, but considering the character of the coast it would scarcely be prudent to do so.

LONG and END ISLANDS.—Long island, half a mile north-east of Cliff island (with 3 to 5 fathoms between them, leading into shoal water), is nearly 2 miles long and undulating, its western hill, which is much the highest, being 180 feet high. Off the projecting points of its south shore reefs extend 1 to 2 cables. Off the bay on its north side, half a mile distant, is an isolated reef which covers at one-third flood, but which is connected under water by rocky ground to the eastern part of the island, and from which, extending 1½ miles north-eastward, is a spit of 2½ fathoms.

End island, off the eastern point of Long island, and connected with it at low water, is smooth and grassy, and 68 feet high. The reefs extending from it all show, and are steep-to in from 3 to 7 fathoms. Outside End island the water deepens at half a mile to 9 and 10 fathoms, but shoals again to 7 fathoms at 2 miles' distance.

OUTER ISLAND and ROCK.—Outer island is 1½ miles N.E. of End island, and S.E. ½ E. 6 miles from Temple summit, described on last page. It is narrow, smooth and grassy, being at its highest part, which is near its centre, 116 feet high, and it extends in a N. by W. direction half a mile. On its sea face and its north and south points are low cliffs, and off its north-west points is a shingle spit, 2 cables long, which covers at high water.

Outer rock, 24 feet high, is on the middle of a reef, 2 cables in extent, which lies half a mile south of Outer island. E. by S., a quarter of a mile from this, with the island summit N. by W., is a sunken rock, which generally breaks at low water. There is a 3 to 4-fathoms' passage between this reef and Outer island, and a 6 to 7-fathoms' passage between the reef and End island; the latter is 7 cables wide, but the water gradually shoals to the northward, and only 3 fathoms can be carried through to gain a position inside the islands, on account of the shallow water extending

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north-eastward from Long island. Northward of Outer island the bottom appears to be very even, with a depth of 4 fathoms, decreasing to 3 fathoms.

REEF ISLAND, N. by E. ½ E. 3 miles from Outer island, is 30 feet high and three-quarters of a mile in extent at low water, but the eastern part is covered at high water with the exception of two detached rocks. Between it and Yuang-shan hill, which bears from it W.S.W. 2 miles, is a large reef half a mile in extent, and the channel between the latter and Reef island has 2½ fathoms.

ANCHORAGE in 3 to 4 fathoms may be obtained between reef island and Outer island, with shelter from south-west winds; but there is no part of the coast for 36 miles north of cape Adkins where there is shelter from winds between south and north-east.

BAR ISLAND,* or Tu-shing, 99 feet high and 2 cables in extent, is 7 miles N.N.E. from Outer island. It has a round, grassy summit, presenting the same aspect from every direction, with cliffy sides fringed with rocks. It lies off the entrance of the Ting-tsi river, and as it is inside the sand banks of its bar, it should not be approached on passing within 2 miles.

The extremity of a bank, 5 miles in length, and over which is 4 to 6 feet water, lies half a mile east of the island; and on it, S.E. one mile from the island, is a large patch of rocky ground of 10 to 12 feet. North-eastward of the island, nearly awash in some parts at low tide, and from half to 1½ miles distant, is Vanhear patch. West half a mile from the island is a rocky patch which covers at 2 feet rise of tide; and W.S.W. one mile is a sand patch of considerable extent which dries at low water; and W.N.W. one mile from the island is the eastern tail of a sand bank, 2 cables wide, which extends 2 miles up W.N.W., is covered at high water and forms the north side of the channel of the river.

TING-TSI RIVER ENTRANCE, has the appearance of a deep inlet. It does not appear to be much frequented, as only a few small junks were seen. On some Chinese maps the river is named Lih ho. At the head of the inlet stands the town of Kin-kia, formerly an important trading place. The entrance, 4 miles westward of Bar island, is about 3 miles across, but the navigable channel is less than half a mile wide and subject to changes.

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* *See* Admiralty chart of the Gulfs of Pe-chili and Liau-tung, No. 1,256; scale $m = 0{\cdot}1$ of an inch.

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Green head, at the south point of entrance, is 4 miles W. ¼ S. from Bar island. It is a steep-sided, round-topped hill, with a ruined fort on its summit, and is the eastern of a range of small hills north of the sandy plain and shore that lies at the base of the Kwan shan range; from the southward it appears almost disconnected from the mainland. Thence, the general direction of the south shore of the river is N.N.W. for about 7 miles, but it is much cut up by deep inlets where, at low water, the mud dries out from point to point. The most conspicuous hill on this shore is 2¼ miles to the westward of Green head, is 517 feet high, and its summit has the appearance of having once been fortified. The northern shore of the river is low with long projecting reefs, and is faced by extensive sandbanks. Two isolated hills on this shore are very conspicuous; one rising from the level land which forms the north point of entrance, is 292 feet high, and N. by W. ¾ W. 4 miles from Bar island; the other, 3 miles farther inland, W.N.W. is Triangle hill, 540 feet high, an excellent land-mark, showing a remarkably sharp top from all views.

River Islet, 30 feet high, is on the north shore, one mile northward of the narrow promontory extending north-westward from Green head. The north bank of the river, hereabout, is steep mud, and its direction N.W. by W. for about 3 miles, the river channel having a breadth of 5 cables, and a depth of from 4 to 6 fathoms. Westward of Triangle hill is an inlet 4 miles deep which is dry at low water; above this the river has not been surveyed.

The Bar.—The river is barred by a long spit, 2 to 4 cables in width, which stretches in a E.S.E. direction from Green head nearly 4 miles, and then curves northward, its extremity being 4 cables east of Bar island. The depth on it at low water is 4 feet, deepening on both sides to 3 and 4 fathoms; it mainly consists of sand but is in some parts rocky. Between the tail of the spit and Bar island is a passage of 7 to 8 feet, and between it and Vanbear patch a depth of 12 feet.

Directions.—At high water springs, a direct course can be steered in, with a depth of 15 feet, across the Bar spit, with the summit of Green head W. by N. ¼ N., and just open to the southward of the more conspicuous hill behind it, which mark also leads clear and to the southward of the sand-patch one mile W.S.W. of Bar island, and which may generally be discerned by the discolored water. When Bar island is E. by N. ¼ N., haul up N.W. to pass between the shoals off Green head and the narrow sand bank, very steep-to, which commences one mile W.N.W. of Bar island, and extends in the same direction for 2 miles. River islet may then be steered for, and anchorage, good and perfectly sheltered, be

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obtained southward of the islet in 4 to 6 fathoms. But a greater depth of water, 7 feet at low water and 18 feet at high water springs, may be carried in by steering direct for Bar island on a W. by S. course, and when at 2 to 3 cables' distance from the island changing the course to S.W. until the leading mark, given above, is brought on.

The COAST now changes its direction from N.E. by N. to E. by N., and continues in the latter direction up to the Shantung promontory, a distance of 60 miles. For the first 12 miles the shore, as far as the town of Hai-yang, is low and sandy, broken in three places by projecting ledges of rock, stretching out some distance, and off the western of which, at one mile from the shore, is a detached reef; this shore cannot be approached, for the depth is only 3 fathoms at 3 miles' distance. Three miles inshore is seen a flat-topped range, 796 feet high and N. by E. 9 miles from Bar Island, a spur of which stretches towards the sea.

HAI-YANG (hien), a walled town one square mile in extent and governed by a petty mandarin, stands at a projecting point of the coast, half a mile inshore and partly on the southern slope of a hill, 399 feet high. The point is low, and from it extends, in a S. ½ E. direction, a ledge of rocks one mile along above water, and another mile under water.

Northward of Hai-yang the country is mountainous. From Hai-yang hill an irregular chain of hills runs first in a northerly direction for 4 miles and then extends eastward, and at 10 miles north-east is the conspicuous dome-shaped summit, 1864 feet high of the Lung-shan range which, in appearance, stretches south-eastward towards the sea and terminates in the long, projecting headland of Tau-tsui. Between these ranges and the coast line is an extensive plain.

Low Point (Laou-lung-tau), is 7 miles E. by N. of Hai-yang point, and between them is an open bay, with sandy shores, marked near its centre by two points, with rocky ledges, 1⅓ miles apart. Low point, which is South of Lung-shan dome, is a T-shaped promontory projecting one mile from the coast line, and the sea face of which, running E.N.E. 1¼ miles, is formed of alternate sandy bays and rocky points. From its eastern extreme a reef extends three-quarters of a mile; from its west extreme the low water rocks extend in a broad ledge south-westward one mile, with uneven, rocky ground for another mile southward.

JU-SHAN KAU, a large bay running back 3 miles, is formed between Low point and Arthur head 6½ miles E. by N. Arthur head is an island connected with the main by flats which dry at low water; its southern face is bold and cliffy and over its western part is a sharp, conical summit, 416 feet high; and off its western extreme is an islet about 150

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feet high. Central islands lie in the bay 3 miles west of Arthur head; they are close together, joined by a sand bank, the outer and higher being 144 feet high. East 3½ cables from the smaller island is a rock which covers at high water. There is no passage between Central islands and the shore, as they are joined to the shore by a spit which dries at low water.

The bay is shallow having about 4 fathoms between the points, with an even bottom decreasing gradually. At its head is the Ta-ho inlet, on either side of which the shores are hilly.

Ta-ho inlet is an arm of the sea having a deep water channel within, formed by the scour of the tides. Its entrance is 2 miles north of Central islands, and is approached on a N.N.E. course so as to clear the sand spit which joins those islands with the east point of entrance of the inlet. The opening of the inlet is 3 cables wide and easily made out, being between the two western of three very conspicuous hills, the centre one of which is a remarkable hill 702 feet high N. by E. of Central islands, and has been described as tusk-shaped, and also an irregular truncated cone. The eastern sharp and conspicuous hill, 598 feet high, is on the same range, 2 miles E.S.E. of the remarkable hill. The west point of entrance of the inlet is 145 feet high, steep-to, and westward of it is a very distinct summit, 649 feet high, above which rises, over the head of the bay, an extremely rugged range to the height of 1,166 feet.

It has no bar, properly speaking, for the approach is generally deeper than other parts of Ju-shan-kau bay, but it is necessary to cross a depth of 2 fathoms at low water springs to enter the inlet, which depth will be met one mile north of Central islands, and carried for nearly a mile. The water then deepens suddenly to 7 fathoms outside the entrance. Three-quarters of a mile inside is a small rock 10 feet high, off a point on the east shore, from which the inlet takes a N.E. by E. direction for 6 miles, but only carrying a depth of 4 fathoms for one-third of that distance. The velocity of the tide at springs in and out of the harbour is said to be considerable.

TAU-TSUI HEAD, 4¾ miles east of Arthur Head, is a bold headland at the extremity of a hilly promontory jutting out from the mainland for about 2 miles in a north and south direction. The neck of land to the north of it is low. The highest part of the promontory is a hill on its east side 367 feet high and 1½ miles from the head. The sea face of the promontory extends 2¼ miles westward from the head, and off it are two islands; the large island is one mile south-west from the cape, 174 feet

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high, and connected with the shore by a sand bank, the smaller 120 feet high, lies one mile farther west.

The bay between the promontory and Arthur Head appears capacious from seaward, but there is only a small basin, having 12 feet water within, with an entrance, one cable wide, between extensive ledges of rocks from either side.

SUTHERLAND ROCK, 24 feet high, lies 3 miles S. by E. from Tau-tsui Head, E. by N. ½ N. from it is another rock awash at low water. Between the rocks and Tau-tsui are even depths of 8 to 10 fathoms decreasing to 6 fathoms when the promontory is passed, but outside the rock the ground has not been sufficiently examined and it should not therefore be passed within a mile.*

LANG-NWAN KAU.—This bay, north-eastward of Tau-tsui, is too shallow and exposed to afford good anchorage; the bottom is even, decreasing gradually from 4 fathoms towards the shore. The east shore of Tau-tsui promontory is bold; the north-west part of the bay, where a small islet lies, has a depth of 2 fathoms. The island Wu-li tau, standing on a reef 2 miles in extent stretching out from the shore, forms the north-eastern point of the bay; it is 35 feet high, and wedge-shaped with cliffs to the east.

TAU-TSUI to TSING-HAI-WEI.—From Tau-tsui to Tsing-hai-wei 27 miles E. by N. is a long stretch of low sandy coast falling back in a bight, with hill ranges some miles inshore, with the exception of one conspicuous peak which rises from the shore 10 miles N.N.E. of Tau-tsui. This is mount Davis, 1,177 feet high, which is also 27 miles W. by N. ¾ N. from Staunton island. Between Tau-tsui and Tsing-hai the depths are only 4½ to 4 fathoms, which about midway is 8 miles from the coast; the soundings decrease evenly and the bight is very shallow.

Tsing-hai Bay, formed westward of the point on which stands the town of Tsing-hai-wei, is too shallow to be navigated except by boats. Off its western point of entrance, which is a low hilly point of the coast, N.W. ¾ W. 13 miles from Staunton island, are Red islets, a group of small rocky islets, connected by reefs and sandbanks with the shore, and spreading over an extent of 1½ miles. There is a small fort on the islet next the point, and east of the group is a sharp pinnacle rock. The water is very shallow about them. The outer islet, 120 feet high, which is separated

* The latitude of this rock by N. and S. stars, observed by Commander John Ward, R.N., is 36° 41′ 53″ N.

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from the others by a 10 feet channel, has a reef extending off its south point, and a detached rock 30 feet high at 3 cables to the south.

The entrance is 7 miles wide, but there are only 3 fathoms across it except close to its eastern point, under which small craft may find shelter from east and south-east winds. This point is rather low, and rocks extend half a mile to the south-west of it, to a low island which is steep-to on the outside, in 4 fathoms. The walled town of Tsing-hai-wei stands on the hills at the back of the point.

Westward of Tsing-hai bay is another large bay, 4 miles across and 5 miles deep, but it is entirely dry at low water.

EASTWARD of TSING-HAI-WEI the low land extends 2 miles, skirted by reefs, when the hills begin, the western of which is cupola shaped, 500 feet high, with a large reef off it; thence the coast trends E. by S. 6 miles under a mountain chain, called Cha-shan.

This high mountain chain has five well defined peaks, of heights decreasing from Needle peak, 1,818 feet high, the western to the eastern which is nearly detached and 1,050 feet high. Needle peak is very sharp and the highest land on the south-eastern part of the Shantung peninsula. Spurs of the range descend to the sea, and the coast along its base is irregular in outline. At 3 cables off a small head S. by W. of Needle peak is a reef awash, and there is another at 6 cables W.S.W. of the head. Between the third and fourth of these peaks (reckoning from the westward) is a small bay one mile across, with reefs off both points, and one at the entrance, half a mile S.E. of its western point. The eastern point of this bay is the southernmost point of the Shantung peninsula, and lies South of the fourth hill of the range; at half a mile off it is a deep-water gully of 10 to 15 fathoms, the surrounding depths being 5 and 6 fathoms.

STAUNTON ISLAND, or Su-shan tau, lying S.W. by W. 15 miles from the south-eastern point of the Shantung peninsula, is 6½ miles S.E. by S. from Tsing-hai-wei point. The island is a ridge of steep hills, about a mile in length N.W. by W., and half a mile in extreme breadth, with a low islet off its north-west point. There is a fishing village and landing place* on its north side, directly under the centre hill, 353 feet

* *See* Admiralty Chart of the Gulfs of Pe-chili and Liau-tung, No. 1,256, scale, $m = 0{\cdot}1$ of an inch. The small rock off the landing place on the north side of Staunton island, is a principal astronomical position. It is in lat. 36° 45′ 29″ N. (Ward and Wilds), long. 122° 16′ 19″ E. (Wilds) and on this all the longitudes of places in the Gulf of Pe-chili and coasts of Shantung depend. *See also foot note page* 703.

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high, which is its highest part. There is also a landing place in a bay formed by a rocky promontory on the south side, with the summit bearing East.

CHANNEL ROCKS lie respectively N.W. by N. 1¼ miles, and N. by W. ¾ W. 1¾ miles from Staunton island, and are north and south of each other three-quarters of a mile apart. North Channel rocks are a cluster of three small islets of a yellowish colour, the centre one being 74 feet high and steep-to, with a small rock one cable South of it. The South Channel rock is 43 feet high.

The passage between the rocks has 10 to 14 fathoms water, and appears clear of danger; that between South rock and Staunton island also appears to be clear, and carries 14 fathoms. The general depths about Staunton island are 10 fathoms, but close to its north and south sides the scour of the tides has deepened the water to 14 fathoms.

TIDES westward of Staunton Island.—The following observations on the tides were made in 1865 during the survey of H.M.S. *Swallow*. It is high water, full and change, at Tau-tsui head, at 3h. 20m., and springs rise 12½ feet; at Low point at 3h. 42m., and springs rise 12 feet; at Star reef in Loshan bay at 4h. 53m., springs rising 11 feet and neaps 8 feet; at Kyau-chau bay at 5h., springs rising 12½ feet and neaps 9 feet. See also pages 534 and 538. The flood stream in the neighbourhood of Staunton island sets West, and the ebb East, at the rate of 1½ miles an hour, which appears to be the velocity observed all along the coast,* but between Staunton island and Channel rocks the rate is 3 knots, and off cape Yatau 2 knots. At 5 miles southward of Tau-tsui head the flood stream runs W.S.W. and the ebb stream E.N.E.; and farther southward the stream appear to follow the general direction of the coast in a similar manner, except at 2 miles outside Outer island where for the first two hours after low water the stream sets North 1½ miles an hour, this deflection being probably caused by the flood tide setting into Ting-tsi harbour. Eastward of Staunton island the tidal streams which are more complex are fully described below.

TIDES of the Shantung Promontory.†—It may be stated as approximately correct, that on the southern side of the Shantung peninsula, the flood stream sets westward, whilst on its northern side it sets eastward. This, however, is not strictly true, nor would it form any

* This is probably the velocity at springs, although it is not so stated.

† It is thought probable that further observations may determine that the turn of the tide at these various places is more nearly simultaneous.

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guide to determine the time of the change of stream, for the times of high water at various parts of the peninsula, from Tsing-hai bay to Wei-hai-wei, alter considerably at short intervals of distance, whilst the tidal streams change almost simultaneously at short intervals of distance. The change of stream has therefore been referred to the change tide of one particular place, namely, Sang-kau bay on the south-eastern face of the peninsula (page 559).

Sang-kau bay has been adopted both because it is the place on which the tidal wave first strikes on the coast of Shantung, and its establishment has been more accurately determined than that of any other position on the coast. Here it is high water, full and change, at 0h. 55m., and springs rise 7, neaps 4½ feet.

To the south of Sang-kau bay.—It is high water at Staunton island at 1h. 30m., and springs rise 8, neaps 5½ feet; at Shih-tau bay at 1h. 30m.; at Chu-kia-kiuen (Wangkia bay) about 2h. 30m.

To the north of Sang-kau bay.—It is high water at Aylen bay about 2h. 30m.; at Litau bay about 3h., and springs rise 6, neaps 4 feet; at Shantung promontory, about 4h.; and at Wei-hai-wei, at 9h. 30m. There is a peculiarity in the a.m. time of high water at Staunton island, Shihtau, and Sang-kau; the a.m. tide, instead of occurring 12h. 24m. before the p.m. or change tide, takes place respectively at those places at 10h. 45m., 10h. 30m., and 10h. 15m. before it.

At the time of high water in Sang-kau bay, the stream is at its strength round the Shantung peninsula running to the southward, from Alceste towards Staunton island, as it is also during the 1st hour of the ebb. At 2nd hour of ebb it slackens at Alceste; at 3rd hour ebb the stream has made west at Alceste, and is slackening off Sang-kau bay; at 4th hour ebb it slackens at Staunton island; at 5th hour the stream has made eastward at Staunton island, and is then setting right round the promontory to Wei-hai-wei, and so continues until the 2nd hour of flood, when it slackens at the promontory and changes, and a little later at Sang-kau; at the 3rd hour flood the stream slackens and changes at Staunton island, and is then running out of the gulf of Pe-chili all round the promontory from Alceste to Staunton island. And by observations made south of Leu-kung island at Wei-hai-wei the stream at that place would appear to change about the same time as at Alceste island.*

The annexed table (extracted from the Remark Book of Navigating Sub-Lieutenant E. Greaves, R.N., H.M.S. *Dwarf*, 1875), gives the correction to be applied to the time of high water at Sang-kau bay,

* By Commander Chas. J. Bullock, R.N., 1863.

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(according to the sign), in order to determine the approximate time of change of stream off Shantung promontory and its vicinity:—*

	Sign.	H.	M.	
Off Staunton island†:				
West stream slackens - - - -	+	3	53	
Stream makes to eastward - - -	+	4	20	
East stream slackens - - - -	+	9	0	
Stream makes to westward - - -	+	9	20	
Off Sang-kau bay. For low water - -	+	6	0	
South stream slackens - - - -	+	2	50	
Stream makes to northward - - -	+	3	18	
North stream slackens - - - -	+	8	30	
Stream makes to southward - - -	+	9	0	
Off Shantung promontory:				
East stream slackens - - - -	+	1	50	
Stream makes to westward - - -	+	2	20	
West stream slackens - - - -	+	8	0	
Stream makes to eastward - - -	+	8	30	
Off Wei-hai-wei:				
East stream slackens - - - -	+	2	0	
Stream makes to westward - - -	+	2	30	
West stream slackens - - - -	+	8	10	
Stream makes to eastward - - -	+	8	40	
Ten miles west of Miau-tau islands:				
Stream makes to westward - - -	+	10	0	or at H.W.
Stream makes to eastward - - -	+	4	0	or at L.W.

The west stream at Staunton island is the north stream off Sang-kau bay, and the east stream off the promontory, or running from Staunton island *into* the Gulf of Pe-chili, and vice versâ.

The velocity of the stream off Staunton island is 2 to 2½ knots at springs, and from half to one knot at neaps. This *is* also about the average rate of the stream along the coast northward, except off the Shantung promontory and inside Alceste island, where it is much stronger, probably 3 or 3½ knots at springs. In the bays the stream is weak and changes generally an hour or two before the regular stream outside. Eddy tides are found in some of the bays, and there is also an eddy tide close to the south of the promontory. The stream at Staunton was accelerated by a fresh breeze, and the contrary stream retarded both in duration and force,

* Too much confidence should not be placed in this; as it is considered open to confirmation.

† The change of stream during a.m. tides will probably take place 1 hour 15 minutes later.

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particularly at the neaps; on two occasions the stream ran 8 hours one way and 5 hours the other. The stream runs East and West, but it once set N.E. and S.W. without any apparent cause.

Actæon Shoal, a depth of 22 feet was reported by H.M.S. *Actæon* in 1860, in lat. 36° 31½′ N., long. 122° 28′ E., approximately.*

WANG-KIA BAY, properly Chu-kia-kiuen,† is between the eastern end of the Cha-san range and Mount Otter. It is a small circular bay or harbour, with a stream running into it from a valley on the north-west. Two islands lie half across the entrance, connected by reefs to the western point on which is a small town. These islands shelter the bay from the south, but it is open to the south-east. The entrance, three-quarters of a mile wide, is eastward of the islands in the entrance, which are steep-to, but a reef lies a quarter of a mile off the eastern point of the bay on entering. The latter point, high and cliffy, is the southern part of mount Otter, a flat-topped mountain range 1,355 feet high, having to the north of it a hunch-shaped peak, 1,240 feet high, a conspicuous object from the sea. The western side of this bay is low and sandy. The anchorage is in 3½ to 4½ fathoms, between the outer island and the opposite high shore: or in 13 feet north of the inner island.

From Chu-kia-kiuen a low rocky shore trends E.N.E. 2 miles to the low western point of entrance to Shih-tau bay. On this part of the coast, under mount Otter, are two hills with irregular summits, 500 feet high, off the eastern of which is a small island. Reefs extends off the shore, but it may be passed in safety at half a mile in 6 or 7 fathoms.

SHIH-TAU BAY is between the mount Otter range, and a low island which forms the south-eastern part of the peninsula of Shantung, and which is joined to the main by extensive sands, 1½ miles across. The northern shore of the bay is very rocky, and is under a sharp rugged peak 880 feet high, the southern extremity of a range, the centre part of which is an even-topped saddle 863 feet high, with a temple on it; there is but a slight depression between the two summits, which make as one on a N.N.W. bearing. A town stands on the western shore of the bay, westward of a small rocky head, with a gingall fort on it; it has some trade with Shanghai.

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* Actæon shoal, mentioned in China Sea Directory, Vol. III., 1874, was carefully searched for for several days under favourable conditions by H.M.S. *Magpie* in the two positions hitherto assigned to it, viz: lat. 36° 31′ N., long. 122° 28′ E., and lat. 36° 31′ N., long. 122° 31′ E., but without success, as an equally unsuccessful search had formerly been twice made by H.M.S. *Actæon* and once also by H.M. Ships *Algerine* and *Dove*, this danger has been removed from the Admiralty charts.

† Kiuen means enclosure.

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Small vessels may anchor in any part of Shih-tau bay at half a mile off shore. There are 21 to 22 feet water, east of the town, and right across the bay, and between the outer points are from 5 to 6 fathoms, the bottom a tenacious mud, except near the shores, where there are rocky patches. The bay is open to south and south-east, but in the prevailing northerly winds, it is a good and convenient place for anchoring, to wait for tide when beating round the Shantung promontory. Anchorage can be obtained in 6 to 10 fathoms, to the westward and outside of the bay, at from 1 to 4 miles distance from the land.

SOUTH-EAST PROMONTORY is the name given to the low island 2¾ miles long, N.E. and S.W., and half a mile broad, at the south-east extreme of the peninsula of Shantung. The western end is a bluff of 90 feet elevation, having a conspicuous Pinnacle rock, 70 feet high, a quarter of a mile West of its south point. Low cliffs bound the sea face of the island, which elbows out a little at 1⅓ miles east of Pinnacle rock, where there is a small islet scarcely disconnected from the shore. Extensive reefs, some detached, border the whole shore, which is of the most dangerous character, and should not be passed at less than a mile, except off the western bluff, nor in less than 9 fathoms water. A 6-fathoms rocky patch (there may be less water), lies one mile off shore, with the extremes of the island bearing West and North.

LIGHT.—A revolving white light, showing flashes at *half-minute* intervals, is exhibited from a lighthouse erected on the south-east promontory eastern side of Shih-tau bay. It is elevated 96 feet above the sea, and should be visible in clear weather about 15½ miles. The illuminating apparatus is dioptric. The light-tower is of iron, circular, 77 feet high, painted *red* and *white* in horizontal bands. The keepers' dwellings and boundary wall are *white*.

Fog Signal.—The signal is a 1st class siren, which during thick or foggy weather will give a blast of about 4 *seconds* duration, at intervals of *one and a half minutes*.

Cape Macartney, the north-eastern point of this island, is low and sandy, and half a mile E.S.E. of it are two rocks 8 feet high, off which shoal water extends 7 cables, to where there are 5 fathoms. It is, however, recommended not to pass this cape within the distance of 2 miles in 11 or 12 fathoms, sand, for an 8 fathoms cast, rock, was obtained at 1½ miles East of the two rocks, and other soundings taken indicate a ledge in that direction. A good mark to clear this is, Flat Rocky point bearing North, or the south head of Aylen bay kept twice its width open to the eastward of the Ears rock. There is also a rocky patch of 15 feet one mile N.E. of cape Macartney.

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EAST COAST of PROMONTORY.—The coast of the eastern face of the Shantung peninsula is 30 miles in length, and all its prominent points are in line about N.N.E. Good anchorages abound (page 563), the tides along its shores are regular (page 553), and the coast can be safely approached with proper caution.

There is a deep water gully of 19 to 22 fathoms off the S.E. promontory at 3 to 5 miles' distance, outside of which the depths decrease to 16 and to 12 fathoms at 16 miles off-shore. This gully runs right along the promontory, and nearly parallel to it, but is very narrow off Aylen bay, where it is only 16 fathoms deep, but northward of this it again deepens to 23 fathoms.

Directions.—For sailing vessels bound from the southern to the northern ports of China, which, owing to the prevalence of northerly winds, will often have to beat to windward along this coast, which can seldom be done in less than two days, it is considered that the better course to pursue is to keep in shore, taking advantage of the favourable tide and anchoring during the adverse, rather than beat up in the offing against the short chopping sea which prevails.

EARS ROCK, lying N.E. by N. 3 miles from cape Macartney, is 60 feet high, and, in some directions, has the appearance of an ass's ears. It is rocky on all sides, the reefs being elongated to a quarter of a mile north and south of it, and also towards a low point of the coast $1\frac{3}{4}$ miles to the W.N.W., where a dry reef was seen half way to the shore. There is also a reef which dries North $8\frac{1}{2}$ cables from Ears rock, but the ground about it has not been examined.

Ears rock can be passed safely at a mile in 10 or 11 fathoms, or perhaps at 3 cables in 8 fathoms. A partial examination of the bay between this and cape Macartney indicated that it was clear of danger.

FLAT ROCKY POINT or Pu-ka tau, is $4\frac{1}{2}$ miles N. $\frac{1}{2}$ E. of Ears rock, and all the coast between it and cape Macartney, 7 miles to the southward, is low. The point is very low, flat, and three-quarters of a mile in extent east and west, and when first seen makes like an island, being only joined to the coast by a narrow isthmus of sand, 2 miles in length, on which is a small village. There is also a small village and temple on the inner part of the point.

At 7 cables S.W. by W. from the point are two rocks, from which a ledge, which uncovers at low water, extends 4 cables to the E.S.E. The bay to the south, only partially examined, appears clear. Reefs extend a cable or two off the east and south sides of the point, which may be safely approached, but a rocky spit extends a mile from the north side, to clear which do not bring Boulder island in Sang-kau bay to the westward of

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W. by S. The northern shore of the sandy isthmus is also shoal, and 7 cables off the village on it lies a reef which covers.

SANG-KAU BAY, between Flat Rocky point and Shu-a-tau head, 7 miles to the north, has on its west and south shores two hills, both isolated and of the same steep rugged character. The one on the west shore, Rugged Bay hill, 500 feet high, bears N.W. by W. $\frac{3}{4}$ W., $7\frac{1}{3}$ miles from Flat Rocky point, and the other, Laou-ma-shan, 395 feet high, W. by S., $5\frac{1}{2}$ miles. Boulder rock, W. $\frac{3}{4}$ N. $4\frac{1}{2}$ miles from Flat Rocky point, is S.E. by S. from Rugged Bay hill in the south-western part of the bay at the entrance of a deep arm or inlet, $2\frac{1}{2}$ miles long and with 9 feet water at its head. The rock is a mass of large boulders, 40 feet high, steep-to on the outside in 3 fathoms, and has a reef extending from it S.W. half a mile. At about a mile off shore north of the rock, is a reef 2 miles in length, north and south, on which only a few rocks show at high water. The northern shore of the bay has a low cliff bordering it, from which reefs extend 1 to 3 cables; thence a low sandy shore runs S.S.W. towards Rugged Bay hill, north of which a small stream issues from a lagoon; fronting the lagoon are sand banks, and a reef 5 feet high, at 6 cables off shore.

Shu-a-tau head, the northern point of Sang-kau bay, has a sea face a mile in length, bordered by a broken and irregular cliffy shore, fringed with reefs 2 or 3 cables in extent, on one of which is a large sphynx-shaped rock 25 feet high. On the northern point of the head is a rather conspicuous, reddish, smooth-topped hill, 240 feet high, with a long slope towards the southern point, which is a flat head 100 feet high.

AYLEN BAY is on the north side of Shu-a-tau head, between it and Martha point which lies N.E. by E. $3\frac{1}{2}$ miles from Shu-a-tau hill, and 13 miles S.S.W. from Shantung promontory. Within its entrance the water shoals from 8 to 5 fathoms, mud. Half way along its north shore is Middle point, a rocky head, 100 feet high, with reefs lying a cable or two from it; this divides the shore into two bays, with 3 to 4 fathoms water in them, which are fair anchorages in north-easterly winds. The head of Aylen bay is a low sandy valley.

Martha point or Hai-pih-tau is a low flat rocky cape, forming a double point with a small bay between, and reefs off both points. The Long reef off the northern projection of the point dries out in some parts half a mile N. E. by E., and there is usually a heavy tide race off it The point should be given a berth of $1\frac{1}{4}$ miles, and not passed in less than 12 fathoms water, until farther examined, for the ground is very uneven to the eastward in from 12 to 20 fathoms.

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LITAU BAY.—From Martha point a low coast, lying under the spurs of the hills, trends N.W. by N. 6 miles, and reefs project from 2 to 4 cables off every point. There is a sandy bay south of a low rocky point, at 3 miles N.W. of Martha point, and a mile W.N.W. of this point is a steep hill over the sea, 340 feet high, which also overlooks the town and bay of Litau on the north.

Litau is a small town 10½ miles S.W. ½ S. from the Shantung promontory. It stands on the south side of the bay, and has a considerable coasting trade. Many junks lie here. The bay is rather shallow, and exposed to north-east winds, but sheltered from the eastward by two islands, a quarter of a mile apart, which are connected with each other and also with the shore by reefs dry at low water. They are from 120 to 150 feet high, with gravel cliffs, and appear bold-to with the exception of the eastern point of the outer island, which has a reef off it. The shores of the bay are very rocky; a large flat reef, always above water, lies one mile N. by W. of the outer island and 8 cables off the northern point of the bay, from which point rocks dry half way out towards it.

One mile north-west of Litau bay is another small bay of similar character. Its northern point is a steep narrow headland, on which is a rocky summit, 200 feet high; there is a small islet off the head. A low island surrounded by reefs lies nearly in the middle of the bay, off a point to which it is attached by reefs, which dry at low water.

MAS-HAN POINT.—South of the sandy plain which stretches across the neck of Shantung promontory is a projection, named Ma-shan point, formed by a rugged ridge running into the sea and which terminates in an abrupt cliff. One mile W. by S. of this point is a smooth topped hill, Chalk saddle, which is not white, though excellent chalk is found there. A mile south of the saddle is a low point with a shrine on it, off which is a flat rocky island lying at the north side of entrance to an inlet running in 2 miles to the north-west.

There are 4 fathoms in the entrance of this inlet, decreasing to 2 fathoms at 8 cables within the island. The inlet is only open to the south-east. Eastward of the flat island, and close off the low point of the shore, is a rocky patch above water; and S.E. 4 cables from the island is a 2 fathoms rocky patch which may be connected with it. Sharp peak open of Ma-shan point, N.N.E. ¾ E., leads eastward of the latter patch, unless it extends much farther out than is supposed; and a point on the north-east side of the inlet, a mile above the flat island, open of the west point of the latter, N.W. by N., clears it to the southward.

Ellen rock, lying 7 cables E. by S. of Ma-shan point, is 6 feet high, steep-to, and may be passed at a cable in 8 fathoms. Reefs which always show, extend 4 cables towards it from Ma-shan point.

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MOUNT WADE is the highest of several flat ranges which stretch across the Shantung peninsula. From its summit, 1,860 feet high, the two principal of its ridges run N.W. and E. by S. for several miles; on the latter ridge, $1\frac{1}{8}$ miles from the summit, is a sharp shoulder, and $2\frac{1}{3}$ miles lower down a curious thumb-shaped peak at the foot of the ridge. These lower spurs are useful landmarks when the summit is clouded.

YUNG-CHING BAY.—An extensive sandy plain from 2 to 6 miles across, separates the Shantung promontory from the high land of the peninsula. South of a sandy eminence on it, 200 feet high, is the walled town of Yung-ching (or Yang-chu-chi, fish-breeding-pool), with large lagoons on both sides of the town. Yung-ching bay, which lies between Ma-shan point and the southern projecting cape of the Shantung promontory, is $4\frac{1}{2}$ miles wide and affords shelter from north-east winds in 4 to 8 fathoms, mud. There is a small rocky point, with a shrine on it, on the low sandy coast about the centre of the bay. A lagoon opens into the sea, just north of Ma-shan point.

SHANTUNG PROMONTORY.—A chain of high peaked hills, 2 to 3 miles in breadth, rises eastward of the sandy plain of Yung-ching and running 6 miles in an easterly direction, forms the Shantung promontory, the eastern extreme of which is in lat. 37° 24′ N., long. 122° 42′ E. These hills when first seen from N.W. or S.E. make like a number of pointed detached islets of peculiar appearance. Five of them are very prominent: the highest, called Ta-ching-shan, 910 feet high, (which is also the Chinese name for the promontory) is the western peak; it is very pointed and precipitous, except to the north, on which side it has a gentle slope. Sharp peak, 689 feet high, half-way between this and the extreme of the promontory, is also remarkable, with deep valleys on either side.

On the extreme of the promontory is a sharp, smooth, conical hill, 265 feet high, from which a ridge or shoulder runs into the sea, ending in a rugged broken cliff, on which cable from the point, is a small square pagoda or tower; a large temple stands on the southern side of this hill, a little below the summit. There are two rugged hill masses south-east of Sharp peak, the outer of which, on the sea coast, forms a projecting cape on the southern part of the promontory, called Lung-siu-tau, or the Dragon's beard, which terminates in a flat rocky point with a shrine on it.

There is a tide race for a mile off the extreme of the promontory which is steep-to, their being 25 fathoms at a quarter of a mile, and 50 fathoms at $1\frac{1}{4}$ miles East of it. This latter depth is at the southern part of a deep gully a mile wide, which from thence runs $4\frac{1}{2}$ miles to the N.N.W. and carries 37 to 50 fathoms water over sand and gravel, or mud and shells.

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Between about 5 and 13 miles off the promontory is a belt of 17 to 19 fathoms water, which encircles the coast from the northern side of the promontory to the Actæon bank (see page 556), where the water is 7 to 8 fathoms shallower; this belt will, with attention to the lead, be found a useful guide in foggy weather, for outside it the water deepens gradually to 40 fathoms, and inside it more suddenly to 20 fathoms off the south-east part of the peninsula, and to 50 fathoms off the promontory.

There is another deep water gully of 19 to 22 fathoms off cape Macartney, which extending to the northward, meets that off the promontory.

The north-eastern face of the Shantung promontory is a rocky indented coast, $2\frac{1}{2}$ miles in extent, the north-west point of which is a steep bluff (Bluff point) $1\frac{1}{4}$ miles south of Alceste island. Along the shore are low hills, and several small bays, and many rocks lie off it, dry or covered; still it may be safely passed in 15 to 20 fathoms water, being careful to avoid Tiger's tail rock. There is a heavy overfall at $1\frac{1}{4}$ miles north of the most projecting point, where a depth of 10 fathoms, rocky bottom, was obtained, but the spot was not further examined.

Tiger's tail rock, (Rodney rock,) called by the natives Ngo Lau. The rocks off Bluff point on with the summit of the mound joining west entrance of Ma-lau lead direct on to the rock, which is awash at low water springs, and is clearly seen with a heavy sea on. From the rock, which lies 4 cables from the shore:—

North-east promontory bears - -	S.E. by S.
Abrupt cliff - - - -	West.
Western extreme of Alceste island -	N.W. by N. $1\frac{6}{10}$ miles.

Directions.—To pass inside of Alceste island keep Kiming island shut in until you have passed a remarkable steep-sided crag situated a little to the west of the highest peak of the hills on the sea coast, or keep 100 yards off the shore of Bluff point, and no less than 7 fathoms of water will be found.

The white-peaked rock a little west of the highest part of Alceste island clears the Tiger's tail rock to the westward.*

The channel between Bluff point and Alceste island has 20 to 25 fathoms water in it, and with the exception of the above-named rock is considered clear of danger. The two large bays west of the former were not examined, their appearance indicating that they were exposed to the prevailing winds, and unfrequented.

* Navigating Lieutenant Balliston writes that H.M.S. *Vigilant* passed between the rock and Alceste island, the channel being about a mile wide, the gain however by using that channel being so small that he considered it scarcely worth risking the danger; further that this passage should never be attempted at night.—Remark Book of Navigating Lieutenant G. W. Balliston, R.N., H.M.S. *Vigilant*, 1875.

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SHANTUNG LIGHT, fixed *white* and *red*, dioptric, of the 1st order, and exhibited from a circular white painted stone tower 64 feet high, shows *white* from between the bearings of S.E. by E. ½ E. to S.S.E. ¾ E., *red* from S.S.E. ¾ E. to S. by E. ½ E., *white* from S. by E. ½ E. through west and north to N.N.E., and *red* from N.N.E. to N.E. ½ E. The light is obscured by hill peaks between the bearings of S.E. by E. ½ E. and S. by E. ½ E.; and also by Alceste island between the bearings of S.S.E. and S.S.E. ½ E., is elevated 220 feet above the level of the sea, and in clear weather the white light should be seen from a distance of 22 miles. It is situated on the N.E. extremity of the north-east promontory of Shantung, in latitude 37° 24′ N., longitude 122° 42′ E. (approximately).

Fog Signals.—In thick or foggy weather, when a vessel is known to be in the vicinity, two guns will be fired with an interval of *one* minute between them, to be repeated if necessary after a further interval of *ten* minutes.

ALCESTE ISLAND, or Siau-ching-shan, 210 feet high, triangular in shape, flat-topped, and bounded by cliffs, lies 3½ miles N.N.W. ½ W. from the extreme of the Shantung promontory, and 1¼ miles off shore. A cluster of reefs extends 4 cables north from its east point, the outer reef of which is awash, but the others are higher. There is also a small pinnacle rock a quarter of a mile south from the same point, with a small rock awash close to the south-east of it. The tides are strong inside Alceste.

ANCHORAGES at Shantung Promontory.—The following are the safest and most convenient anchorages along the coast just described. From S.S.W. to S. by W. of Ears rock, in 5 to 8 fathoms, with the Temple saddle bearing E.N.E. In 5 to 6 fathoms in the bay between Ears rock and Flat Rocky point, avoiding the before-mentioned patches and reefs. At any part of Sang-kau bay in 4 to 6 fathoms, and under Shu-a-tau head in 5 to 7 fathoms, with shelter from north-east winds. In Aylen bay W.S.W. to S.W. by W. of Martha point in 4 to 5 fathoms, or in the centre of the bay in 6 to 7 fathoms. In 6 to 9 fathoms, between Martha point and Shantung promontory; and in the northern part of Yung-ching bay (only partially examined) in 4 to 7 fathoms.

Small craft can also find anchorage in Litau bay, or the inlet on the south side of Chalk saddle in 3 to 4 fathoms. In 1875 H.M.S. *Mosquito* found very good anchorage for small craft in a bay northward of the promontory near the lighthouse. This bay has a few rocks running off the eastern point at the entrance, but is well sheltered from all quarters except northward; the bottom is mud.* Anchorage can also be obtained off its

* Remark Book of Navigating Sub-Lieutenant W. H. Buckner, H.M.S. *Mosquito*, 1875.

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north-eastern face in 5 to 8 fathoms, 2 to 4 cables from the shore; likewise in the bay on its south-west face one mile from the extreme of the promontory in 5 to 10 fathoms, with a rock or islet there bearing North, and the end of the beach under the rugged hill, W. by N.

DIRECTIONS for passing Shantung Promontory.—Vessels bound to the northward into the gulf of Pe-chili in the spring, are liable to pass Shantung promontory in foggy weather, without making it. It has been generally observed that the effect of the tides is nearly neutral, as regards being set east or west in a two or three days' run; nevertheless, in rounding at such a time, a vessel's position may be ascertained if there is any doubt about it by constant use of the lead. Thick weather is not of unusual occurrence here, and this, together with the strength of the tidal streams (described at page 553), renders it prudent to keep the vessel's position fixed by cross bearings, as the coast between the promontory and Wei-hai-wei cannot always easily be identified, and it sometimes becomes necessary to anchor at night.

KI-MING ISLAND.—From the high land of the Shantung promontory a low sandy coast, broken by rocky points, trends W. by N. 14 miles to Wei-hai-wei. The island of Ki-ming or Nan-ming tau, 9 miles W. ½ N. of Alceste, lies one mile off a rocky point which projects considerably from the shore. It is 370 feet high, flat-topped, surrounded by extensive reefs on three sides, and joined to the shore by a rocky flat over which are not more than 3 to 4 fathoms, but the island may be passed to the northward at 2 cables in 12 fathoms. A large lagoon (salt) opens into the sea eastward of this point.

WEI-HAI-WEI HARBOUR,* 23 miles westward of Alceste island, is formed between Leu-kung-tau, an island 510 feet high, and a deep bight of the coast, and is the most eastern anchorage on the north shore of the Shantung peninsula. It is easy of access and capable of affording shelter to a considerable number of vessels of moderate draught, but the anchorage is contracted for large vessels. It has two entrances, one on the west the other on the east side of Leu-kung-tau, thus affording a facility for access or departure with almost any wind. The town of Wei-hai-wei stands on the side of a hill on the west shore of the bay, its wall enclosing as well as the town, a considerable space allotted to gardening purposes. The population appear to be fishermen and agriculturists. Large fleets of junks come from Lai-chau-fu on the south shore of the gulf of Pe-chili, and from the neighbouring localities, in the spring of the year, to fish, when the herring season commences.

* *See* Admiralty Plan of Wei-hai-wei harbour, No. 2,823; scale, *m*=2 inches.

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The western entrance, although much narrower than the other, has the deepest water, and should be used by all vessels drawing above 18 feet. The soundings in it are 10 and 12 fathoms, but when abreast Observatory island (a low rocky islet near the west extreme of Leu-kung-tau), they increase suddenly to 17 fathoms, but decrease again rapidly to 5 fathoms; after which the depth gradually decreases towards the southern shore, and into the western part or bight of the bay where the town is situated.

Round island and three or four adjoining rocks lie off the northern point of the western entrance. The outer rock, 15 feet high and steep-to, is three-quarters of a mile E.N.E. from the point; between it and Round island is a rocky patch which covers at high water; no other hidden dangers are known. At half a mile E.S.E. from the eastern end of Leu-kung-tau, is a reef of rocks, steep-to, but as a portion of them always shows above water, they may be easily avoided.

Anchorage.—The best anchorage is near the west point of Leu-kung-tau, in 5 to 7 fathoms on excellent holding ground of mud, sheltered by the island from the north-east. H.M.S. *Actæon*, April 1860, anchored in 5 fathoms, with the summit of Leu-kung-tau N.E. by N., a small gingall fort N.W. ¼ W., the west extreme of Observatory island N.N.W., and centre of Channel island, S.E. ⅔ E. This position is only open from S.E. by E. ¼ E. to E. ½ S., while to the westward the mainland is well overlapped by Observatory and Leu-kung-tau.

Supplies.—No bullocks could be obtained at Wei-hai-wei; although at several parts of the coast, a little way inside the first range of hills, numerous droves were seen. A few ill-conditioned sheep, and a small supply of poultry were procured, and some pigs; fish (herring and cod) were in great abundance, and there was a fair supply of shell fish. Of vegetables only a few onions were obtained. The grain grown is wheat, buck-wheat, millet, &c.

Water in small quantities was found in April at the well of a village on Leu-kung-tau. A small stream waters the eastern wall of Wei-hai-wei in the rainy season, but in the months of March and April, with the exception of two or three little pools, into which trickled a very small stream, it was quite dry. Another stream in precisely a similar condition was found running through the first village south of the town.

Fuel is not to be obtained, the natives having barely enough wood and straw for their own immediate culinary necessities. A small quantity of charcoal is consumed by them. No coal was seen, nor did the peasantry appear to know of it.

TIDES.—In Wei-hai-wei harbour it is high water, full and change, at 9h. 30m., and springs rise about 9 feet, neaps 6½ feet. The tidal stream

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outside the harbour changes about the same time as at Alceste island, *see* page 563.

DIRECTIONS.—When bound to Wei-hai-wei harbour from the eastward, after rounding the Shantung promontory, and giving Alceste island a berth of one mile, the course and distance for Channel island, a small round rocky islet in the eastern entrance of the harbour, 40 feet high, is W. ¾ N., 22 miles. This will lead 1¼ miles north of Ki-ming island, and clear of all known danger, up to Channel island, which may be safely approached to a quarter of a mile. From this the soundings will decrease to 3½ and 3 fathoms at low water, over an extensive flat stretching across from Leu-kung-tau to the main shore, but they will increase again as the west end of Leu-kung-tau is approached.*

In working in through the eastern entrance the lead may be safely trusted, there being no hidden dangers known. The shore of the mainland may be approached to a mile, and that of Leu-kung-tau to 3 cables.

Vessels of large draught running for this harbour from the eastward should steer to pass about a quarter of a mile northward of the north point of Leu-kung-tau; and thence, if intending to anchor under Observatory island off the west end of Leu-kung-tau, they should round the west end of that island at about 2 cables, and then steer for the anchorage.

Round island and the adjoining rocks are conspicuous marks for the west entrance, when approaching it from the north-westward. The outer rock is steep-to, and its east side may be passed at a cable.

WEI-HAI-WEI to CHIFU.—The land north-westward of Wei-hai-wei, and which forms the harbour on that side, is a hilly peninsula, 900 to 1,200 feet high, with rocky shores. Its northern point is cape Cod, 4 miles from Leu-kung-tau. Eddy island, 1¾ miles W.N.W. from cape Cod, is somewhat low with scarped cliffs, and having a rock off its N.E. end, lies one mile N.E. from the extreme of a narrow, jutting peninsula, 2 miles in length, on which is a remarkable peaked hill with even slopes. From this the coast recedes south-westward for 7 miles to the mouth of a little stream which small junks can enter, and then bends westward again, skirting a low sandy plain for 16 miles farther to White rock point, which is 6 miles E.S.E. of Chifu harbour. There are a few isolated, prominent hills of moderate elevation 1 to 3 miles from the shore line of this coast, backed at 10 miles inland by a rugged mountain range, from which a spur descends to the sea shore 4 miles eastward of White rock point. One mile eastward of this spur is an opening that small junks can enter, and from the western point of which a long sand spit stretches, on which one of H.M. ships, mistaking White rock point for Kung-kung tau at the entrance of Chifu harbour, was totally lost.

* A wreck was lying in 1877 in about 12 fathoms water, from which Ki-ming island summit bore S.E. ¼ S. 9½ miles.

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Caution.—The course from Eddy island to White Rock point is W. ¾ S. 21 miles, and the shore between them should never be approached to a less depth than 9 to 10 fathoms. If not sure of the position at night, the ship should be anchored in that depth, or her head put off shore until daylight.

WHITE ROCK POINT, a low hilly point, so named from the white rock off it, is the north-eastern extreme of the narrow island of Yung-ma-tau which runs S.W. by W. 4 miles from the point, and forms the eastern horn of the extensive bay, the western part of which is Chifu harbour. Two conspicuous hills of equal height (375 feet), the southern of which is Tashan, rise at the south-western part of the island, the other hills on it being low. Yung-ma-tau is bold of approach, and may be passed in 7 fathoms at half a mile.

LUNG-MUN HARBOUR.*—Yung-ma-tau is joined to the mainland by extensive flats of mud and sand which at low tide are left dry, with the exception of a channel wihch has been formed by the scour of the tides. This channel, which is 7 or 8 miles long, leads up to the town of Ning-hai-chau, the position of which is indicated by a pagoda visible from the sea. Its entrance is south of Ya-ma-tau, and 18 feet was carried in at low-water springs in 1860 by a passage one cable broad, over a bar situated 3 cables S.W. of Tashan point. In 1867 there was less water, but the depth over the bar is probably variable, so that it should be examined and buoyed before taking in any vessel larger than a gunboat. For upwards of a mile within the bar the channel is nearly a cable broad with a depth of from 21 to 28 feet water, and is so well sheltered from all winds that vessels might be moored in tiers. The landing place is at Temple point, the south extreme of the island, which is steep-to, and where the principal village is situated. The best position for a stranger to anchor in, is with Temple point N.E. by N. and Tashan point N.W.

This little harbour was re-sounded from the entrance to Temple point, by Lieutenant J. F. Bedford, R.N., Admiralty Surveyor in 1875, when it was found that since the survey of 1860 the entrance had improved and become straight, but the 3-fathoms channel inside the entrance was more limited; also, a bar having a depth of 16 feet had formed to the south-west of the Temple between the outer and inner 3-fathoms channels. The general depths in the harbour throughout were found to have but slightly altered, and the banks drying on either side were nearly the same. Lung-Mun harbour would safely hold a large number of small vessels moored.

KUNG-KUNG ISLANDS* are a group of islands and rocks, of moderate elevation, straggling over an extent of 7 miles, situated at the

* *See* Admiralty Plan of Lung-mun harbour, No. 2,846; scale, $m = 9$ inches.

† *See* Admiralty Plan of Chifu or Yentai harbour, No. 1,260; scale, $m = 1$ inch Also plan of the anchorage on Admiralty Chart of the gulfs of Pe-chili and Liau-tung, No. 1,256.

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north-western part of the extensive bay south-eastward of Chifu, and giving shelter to the spacious harbour of the same name which it forms. Kung-kung tau, the largest of the group, is even-topped in character. The south-west point of Kung-kung tau is a small rise, but the central part of the island, which was the site of the French depôt during the last China war, is low and sandy.

East Sand-spit, which shows at low water, and greatly shelters the anchorage from easterly winds, extends three-quarters of a mile from the south-west point of Kung-kung; from the extremity of the spit, which is steep-to in 4 fathoms, the lighthouse bears N.E. ¾ N. 1½ miles. The leading marks to clear it are given in the directions for entering the harbour.

Arcona Bank.—The German man-of-war *Arcona*, when passing Chifu harbour, observed a shoal apparently about one mile long, on which 4½ fathoms were obtained. From the shoal North rock bore W. by N. ¼ N., South-east island W. by S. ½ S., and White rock S. by W. ¼ W.

North Rock, the outer and north-eastern islet of this group, bears N.E. ¼ E. 4¾ miles from Kung-kung tau lighthouse. Approaching it from the eastward it appears round, with a smooth top sloping southward, but when seen from the northward and westward it is wedge-shaped. A small rock just awash at high water, and therefore nearly always visible, lies N.E. by E. ½ E. 3 cables from North rock, and is steep-to, there being 9 fathoms close outside it.

Double Rock, S.W. by W., 2½ miles from North rock, when seen from the eastward appears, as its name denotes, to be double, the northern part like a wedge; the southern part, which is much the higher, 198 feet, is an irregular mound, rather elongated to the westward. Rocks extend from its western and southern points.

S.E. Island, 60 feet high, bears from North rock S.W. ½ S. 4¼ miles, and is 1½ miles S.E. by E. ½ E. from the lighthouse. This and the two islets just described are safe of approach, and with the exception of the small rock lying off North rock, appear to have no detached dangers. Three high rocks lie between S.E. island and Kung-kung tau, but no hidden dangers near them have as yet been discovered.

Finger Rock, Stick-up Rock and Mound.—Finger rock, the shape its name denotes, is half a mile north of Kung-kung tau lighthouse. Stick-up rock, of similar form, lies to the north of the western islets of the group. Mound islet, where was situated from 1861 to 1867 the British Naval coal store and depôt, is the second islet from the westward. These three are useful leading marks for clearing East sand spit, and approaching the anchorage under the islands.

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LIGHT.—A light is exhibited from a round light tower painted with white and red horizontal bands: 45 feet high, erected upon the highest part of Kung-kung tau. It is a *fixed* white light, elevated 242 feet above the sea, is visible all round within a distance of 2¼ miles; at that distance the light has been observed to be eclipsed, by the island northward, between S.S.W. ¼ W. and S.W. by S.

Fog Signals.—In thick or foggy weather, when a vessel is known to be in vicinity, two guns will be fired with an interval of *five* minutes between them; to be repeated if necessary after a further interval of *eight* minutes. In clear weather it should be seen a distance of 22 miles. The illuminating apparatus is catoptric, of the first order.*†

Fairway Rock and Beacon.—Off the N.W. point of Yentai hill, is a rock which dries one foot at low water springs, on which has been erected an iron rod surmounted by a cage. From this beacon Chifu peak bears N. 4° W., Sentry rock N. 38° E., and Chifu lighthouse N. 85° E.; should this mark be washed away Kung-kung-tau island, kept open of the low water point of Tower head, will clear the rock to the northward.‡

CAPE CHIFU, about 60 miles westward of Alceste island, is the eastern extreme of a mountainous peninsula connected with the mainland by a low neck of land of considerable extent. This peninsula, which is 5 miles long, E.S.E. and W.N.W., and extends in a narrow ridge parallel to the coast line, is high and steep, and when seen from the distance appears like an island. Chifu peak, at the centre of the ridge, is 980 feet high, and has a double top. One cable S.E. of Chifu cape is Sentry rock, which may be closely rounded in 9 fathoms, and the cape is equally bold. The water for some distance out from this rock is often discolored and is apt to frighten a stranger, but no alteration will be found in the soundings.§

CHIFU ‖ or YENTAI HARBOUR, a treaty port, and the only one between Shanghai and Tientsin, is formed in a bight of the coast

* There is a small *red* light shown from the end of the Custom House Pier.—Remark book of Lieutenant J. Roughton, R.N., H.M.S. *Fly*, 1881.

† According to Lieutenant J. C. Jackson, of H.M.S. *Sheldrake*, the Newchwang light vessel is moored at Chifu during the winter from about the middle of November to the beginning of April, when she is removed to the Newchwang bar.—Remark book, H.M.S. *Sheldrake*, 1878.

‡ Chinese Light List, 1884, and Remark book of H.M.S. *Sheldrake*, 1878. § *Ibid.*

‖ *See* Admiralty plan of Chifu harbour, No. 1,260; scale, $m = 1$ inch. Chifu has been adopted as the Treaty port in preference to Teng-chau where there is only an open roadstead. The name of Chifu which has been improperly applied by foreigners to the port, is derived from a small place on the same bay not in any way connected with the port. The description of the port has been mainly taken from the "Treaty Ports of China and Japan," supplemented with the remarks of the captains and navigating officers of H.M. ships who have visited it up to 1882. The harbour is said

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between the peninsula of Chifu and the Kung-kung group of islands, which, being 3 miles in extent, constitute a magnificent, natural breakwater to the harbour, sheltering the various anchorages from north and east. The anchorage space in the harbour, comprising a depth of from 5 to 7 fathoms, is 4 square miles, and for a depth exceeding 4 fathoms, 9 square miles, whilst a depth of 21 feet can be carried up to within 300 yards of Tower head, which bears W. ½ S. 5½ miles from Kung-kung lighthouse.* The town of Yentai, where the foreign settlement is, stands on the sandy shore of a small interior bay westward of Tower head. It is built without design or regularity. On the slope of the hill, facing landward, are some European houses, the highest of which is the British consulate. The summit of Town hill is occupied by a Chinese fort and signal station. There is a Chinese customs' establishment, which is in all respects similar to that at Shanghai.

Supplies.—Contractors supply excellent beef and fair mutton, and there is an abundance of vegetables of good quality, and fruit in season. Game and wild duck, in great variety, abound in autumn and winter. Oysters are plentiful and fish, especially cod, and about the end of March the herring fishery commences, affording occupation for the whole fishing population of this and also more distant parts of the coast. Native shops have been opened for the supply of provisions and stores to Europeans and to the shipping, and one or two foreign stores supply certain kinds of foreign imports, but clothing and other necessaries of the kind and luxuries are usually procured from Shanghai and Hong Kong.

The supply of coal is uncertain.† Inferior Japanese coal was only obtainable in January 1881. In October 1878 Welsh coal could be procured at 15 dollars a ton. Water is the great want here, as it is along the whole of this part of the coast of Shantung. Compradors now supply excellent water brought from the interior at 2 to 2½ dollars a ton, but the water obtained near the shore is unwholesome, and produces diarrhœa and dysentery. When water is required it is customary to hoist signal-flag No. 1 at the fore. At Mound islet there is a well, but the water is brackish, and at the village inside Chifu cape there are wells, but the water is of very inferior quality. Accounts are kept in taels, and petty transactions in cash. The clean Mexican dollar passes current. The standard of Sycee silver accepted at the Chinese custom house is 4 per cent. higher than that prevailing at Shanghai.

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to have generally deepened since the survey of 1860.—Remark book of H.M.S. *Growler*, 1879.

* Gun boats usually anchor during the summer months on about the following bearings:—Sentry rock, N.E.; Tower point, S.E., in 15 feet (L. W. S.), 3 cables distant from Fairway rock Beacon. (*See* page 574.)

† Remarks of Lieutenant J. Roughton, H.M.S. *Fly*, 1881, and Lieutenant Jackson, H.M.S. *Sheldrake*, 1878.

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Trade, Productions, &c.—The exports, which consist chiefly of peas, beancake, silk, prawns, drugs, dates, oil and wheat, amounted in value to 717,951*l.* sterling in 1871. The imports, consisting of cotton and woollen fabrics, metals, opium, seaweed, &c. amounted to 1,954,976*l.* While the whole trade of the port for the year 1879 is placed at 3,326,850*l.*: in the same year (1879) 687 ships entered and 689 cleared, of which 36½ per cent. were British.* The province of Shantung, in which Yentai is situated, has an area calculated at upwards of 65,000 square miles, and a population of 28,000,000. The interior, with the exception of a central tract, is almost an unbroken plain, through which flows the great Yellow river, besides numerous small navigable streams. The productions of the Great plain are cereals, pulse, tobacco, drugs, inferior silk, &c., but the staple articles of trade are peas and beancake, vermicelli, and straw braid, for the shipment of which to southern markets Chifu is the principal port.

The position of Chifu is highly advantageous for trade with the northern ports of Japan, Korea, and the Russian possessions. It is the only harbour open in the north of China from December to March, during which time the Pei-ho remains frozen up, yet during those four months the regular steamers stop running, and few sailing ships enter; the mails for Tienstin, Peking, and Newchwang being forwarded here from Shanghai viâ Chinkiang.

There is regular steam communication during the summer, about two or three times a week with Tientsin and the southern ports, but chiefly with Hong Kong and Shanghai. The communication with any other port during the winter is irregular and uncertain.† The voyage to Shanghai occupies about 48 hours, that to Tienstin about one day, according to the state of the Taku bar on arrival.

Climate.—In point of climate this port is undoubtedly the most salubrious of all those open to the residence of Europeans on the coast of China presenting the combined and notable advantages of a dry atmosphere, a thoroughly bracing winter, and sea air and bathing. The summer, which does not, however, last much more than two months, is hot, but the degree of warmth indicated by the thermometer (rising to 85° and 90°) is tempered by the strong breezes which constantly prevail, and which are sometimes found unpleasantly boisterous. January and February are very cold months, with much snow; April is generally wet; May is a lovely month of genial spring weather; June fine and warm, with rain; July and August hot, and more or less rainy with squalls; the beginning of Septem-

* Report of H. M. Consul at Chifu for 1879.

† Remarks of Lieutenant J. Roughton, H.M.S. *Fly*, 1881, and Lieutenant Jackson, H.M.S. *Sheldrake*, 1878.

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ber still warm, whilst the end of this month and throughout October dry and sunshiny, but cool weather constitutes the autumn. November and December are cold, with much snow in the latter month. The usual minimum temperature is about 20°. Lieutenant F. C. Jackson, R.N., remarks that the winter of 1877–8 was said to be the most severe known for 30 or 40 years, as regards cold. In January 1878 the thermometer fell to 11° Fahr. On several occasions H.M.S. *Sheldrake* was frozen in so badly that all communication with the shore stopped; floating ice, some of the pieces of which were from 4 to 5 feet in thickness, could be seen for miles in the offing, and navigation was impeded both for steamers and sailing ships. In February of that year the British steamer *Taku* was imprisoned for 3 or 4 hours in the ice to the northward of the Kung-kung-tau islands, and afterwards during her passage to Shanghai received such grave damage as necessitated docking.*

Owing to its invigorating air, absence of tropical heat and discomforts, and facilities for exercise and sea bathing, Chifu has already been resorted to as a sanitarium by individuals from the southern ports, and bids fair to attract much attention in this respect henceforward. Its principal drawback in a sanitary sense is the prevalence of rheumatism due to the violence of the winds. In this respect at the same time attention has been drawn to a locality some 50 miles distant where hot springs called Tung Tang are known to exist, and are resorted to by the Chinese as a cure for this disease. It is also affirmed that Europeans long resident at Yentai suffer much from fever and dysentery, and this may in some measure be due to the inferiority of drinking water. The summer temperature ranges from 85° to 100°, that of the winter from 30° to 15°. The climate of the province of Shantung resembles that of northern Europe, or perhaps still more closely that of the northern states of America, and on that account is favourable to European constitutions.

Winds.—The winds in a general manner follow the courses and periods of the monsoons. The summer winds are chiefly from the south-eastward, light and changeable; the winter winds are from the north-westward strong and often violent, but although they are intermittent they are more constant. In these gales, the wind, which usually commences at about E.N.E., veers through North to N.W., blowing with the greatest violence at from North to N. by E.; it is occasionally accompanied by a very high sea, and at N.W. its greatest force is expended. A slight steady fall followed by a rapid rise of barometer is the only warning.

* On January 22nd, 1881, the temperature was 18° Fahr., and the bay was covered with ice so that boats could not be used.—Remark book of Lieutenant J. Roughton, R.N., H.M.S. *Fly*, 1881.

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The following summary of winds and weather at Chifu is from observations taken on board H.M.S. *Sheldrake* in 1878 :—

Month.	Direction of Wind.	Duration in Days.	Thermometer.			Remarks.
			Max.	Min.	Average.	
			°	°	°	
January -	North to north-west.	17	47	15	20 to 34	One northerly gale of short duration. Force, 7 to 9, and accompanied by passing showers of snow. Snow fell on 12 days, the remainder of the month being generally bright and clear.
	Easterly - -	1				
	South to west -	9				
	Calm and variable	4				
February -	North to east -	1	59	17	24 to 45	One northerly gale, lasting 12 hours. Force, 6 to 8. Several strong breezes from the northward and westward. Snow fell on 3 days, remainder of month bright, clear, and bracing.
	South to east -	2				
	South to west -	4				
	North to west -	15				
	Calm and variable	6				
March -	North to east -	4	70	28	40 to 57	One southerly gale, lasting 5 hours. Force, 7 to 9, and two or three strong breezes. Rain fell 2 days. Remainder of the month chiefly bright and clear.
	South to west -	9				
	North to west -	11				
	Calm and variable	7				
April -	South to east -	10	80	46	46 to 61	Three strong northerly, and two southerly breezes, of short duration, with a force of from 5 to 7. Rain fell during 6 days. Fog 1 day. Weather more overcast and gloomy and damper than in previous months.
	South to west -	7				
	North to west -	7				
	Calm and variable	6				
May -	North-east to south-east.	10	84	47	55 to 70	One south-westerly gale; force, 6 to 8; and three strong westerly and north-westerly breezes; force, 4 to 5. Rain fell on 4 days, and the weather was generally cloudy and unsettled.
	South to west -	5				
	North and north-westerly.	9				
	Calm and variable	7				
June -	Easterly - -	16	87	59	67 to 78	No strong breezes this month. Weather generally fine and hot. Rain fell on 5 days, with one thunder storm, and one fog.
	Southerly - -	10				
	Northerly and westerly.	2				
	Calm and variable	2				
July -	South-easterly -	9	90	66	78 to 86	Three heavy thunder storms, accompanied by heavy squalls of rain, from S.W. to N.W. Rain fell on 6 days. There were two fogs, one being very dense, and accompanied by heavy rain.
	South and south-westerly.	9				
	North and north-westerly.	5				
	Calm and variable	8				
August -	North-east to south-east.	21	92	70	76 to 85	The strongest wind this month was from the north; force, 3 to 5. Rain fell on 6 days; always with an easterly wind. Thunder storms on three successive evenings, accompanied by sudden and violent squalls of wind and rain from S.W. and N.W.
	South to south-west.	3				
	North to north-west.	2				
	Calm and variable	5				
September	Northerly and easterly.	16	91	60	69 to 83	Rain fell during 4 days, and there was complete absence of fog or thunderstorm, the weather being generally bright and clear.
	North-west to south-west.	4				
	Calm and variable	10				

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Frequently, in the summer a N.E. wind blows during the heat of the day, and a southerly one at night, forming a regular land and sea breeze.

CHIFU ANCHORAGE.—The harbour although affording ample depth of water for all classes of ships is exposed to the disadvantage of these violent north-westerly and northerly gales, which prevail through half the year, particularly in the winter months. During the last China war the French squadron laid between Kung-kung tau and Tower point during a whole winter and not a ship dragged her anchors. The larger British men-of-war have usually anchored in 7 fathoms with Sentry rock off Chifu cape bearing N.N.W. ½ W., Mound islet (at which was formerly the naval store and depôt) N.E. by N., and Chifu lighthouse E. ¼ N.* In 1881, H.M.S. *Iron Duke* (drawing 23 feet) anchored on the following bearings, Senty rock, N.N.E.; Chifu lighthouse, East; and Staff Commander J. Walker, R.N., recommends that position for a *summer* anchorage. Capt. Henry Boys, R.N., considered this much the best anchorage as the island was sufficiently large for recreation and the climate in summer delightful, and well adapted for recruiting the crews of ships after a lengthened stay at Shanghai or the ports of the Yangtse. There is also fair anchorage off the east side of Kung-Kung-tau.

H.M. ships usually anchor, with Tower point bearing between S.W., and W.S.W. about one mile, in whatever depth, according to the season of the year, was deemed prudent, and the holding ground has proved, as indeed it is in all parts of the harbour, singularly good. Vessels are recommended to moor with open hawse to the northward. Smaller vessels anchor in Village bay on the western side of the harbour,† and also in Yentai bay‡ off the settlement, where there is a depth of from 10 to 20 feet (*see* footnote, page 570), but the former is more preferable, the latter being only safe in summer. Another good winter anchorage§ for small craft is off the village inside Chifu cape. In 1878, two vessels were beached (one a steamer) just southward and westward of the village, at the head of Village bay, and, remarks Lieutenant Jackson, it appeared perfectly safe to beach vessels there, as even with strong north-easterly winds, hardly any sea would be experienced. The north-westerly gales send in a heavy swell and render the anchorage off

* *See* Sketches on Admiralty plan of Chifu harbour.

† In Village Bay, with the Hill over Chifu bluff bearing N. ½ W. and Sentry rock N. 84° E., a vessel may anchor in from 15 to 16 feet water.

‡ To the West of Tower point, on the Fairway rock, an Iron beacon has been erected. From the beacon Chifu lighthouse bears N. 85° E., Sentry rock N. 38° E., and Chifu peak N. 4° W.

§ In November 1865, it being necessary to get H.M.S. *Manilla* alongside H.M.S. *Barrosa* to tranship some horses, after steering round the bay, the only place found where the water was sufficiently smooth was under Chifu cape, with Sentry rock E.N.E. and a fort North.

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Yentai, in some degree insecure, and in the winter months the sea is so heavy in northerly gales that all loading and unloading are entirely suspended. At Yentai small piers and cambers have been built, which afford perfect shelter for safe landing*†. In the summer it appears to be perfectly safe to lie off Yentai, for hundreds of junks arrive from the south in the beginning of the season, and leave at the end of it, remaining at anchor the whole time.

As to the relative merits of this harbour and that of Ta-lien-whan (page 595) for the assembling of a fleet, Commander Goodenough, R.N., of H.M.S. *Renard*, who was well acquainted with both places in 1860, remarks :—"On the whole Chifu is preferable as a station to Ta-lien-whan bay. In the winter, owing to the prevalence of northerly winds, which throw a considerable swell into Chifu, and render operations on the beach somewhat difficult, the anchorage at Ta-lien-whan is preferable for a very large fleet; there is, however, abundant shelter at Chifu for 50 sail, and the Kung-kung islands afford convenient sites for store-houses, &c. The holding ground in both bays is excellent. Neither afford much fresh water, but in this respect Ta-lien-whan is superior. All fresh provisions can be obtained at Chifu, and its climate is superior to that of Ta-lien-whan."

TIDES.—It is high water, full and change, in Chifu harbour at 10h. 34m.; springs rise about 8 feet, neaps 6½ feet. In the offing the tides run strong, the flood tide setting to the southward, and the ebb to the northward. For further information concerning the tidal streams *see* page 553.

DIRECTIONS for CHIFU.—If bound to Chifu from the eastward after rounding cape Cod and Eddy island, the course and distance to the Kung-kung islands is West 25 miles. The high hill over Knob point, 3 miles eastward of Yentai, kept on a W. by S. ½ S. bearing, will lead well clear to the eastward of these islands, giving S.E. island a berth of three-quarters of a mile. This mark should be followed, in order to clear the East sand spit, until Stick-up rock comes on with the western part of Mount islet (the second from the west), when the course may be altered for Mound islet, until Finger rock, which is conspicuous, comes on with the west extreme of Kung-kung tau, then haul up about N.E. by N. or N.N.E., if wishing to anchor close under Kung-kung tau, where the depth will be 4 fathoms, or continue N.N.W., if of light draught, or N.W. if of heavy draught, and anchor in 4 to 7 fathoms as convenient. The bottom is mud,

* Lieut. Roughton remarks that these are now almost useless from the accumulation of sand; at low water they are high and dry. Landing is inconvenient and difficult during strong northerly or north westerly breezes, and at low water almost impossible.—Remark Book of H.M.S. *Fly*, 1881.

† The average number of days on which the weather was too bad to discharge cargo during the five years 1875 to 1879 (inclusive) was 35 in each year, the worst months being December, January, and February.—Consul C. T. Gardner, 1879.

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the holding ground is good, and there is sufficient space for a large number of vessels.

Most sailing vessels bound into or leaving Chifu use the entrance between Chifu cape and Kung-kung tau islands in preference to the eastern channel, probably to avoid the risk of getting embayed between Chifu bluff and cape Cod, the prevalent winds being from the northward, and throwing in a heavy sea which would render it difficult to anchor or claw off. *

If wishing to run on for the anchorage in Village bay under Chifu cape, when the mark for clearing the East sand spit has been reached, Chifu peak bearing N.W. will readily be distinguished. Steer N.W. $\frac{3}{4}$ W. for the head of the bay, and anchor in 4 to 5 fathoms, mud, with the extreme of the cape bearing about N.N.E. or N.E. by N. H.M.S. *Actæon*, in 1860, anchored here in $3\frac{3}{4}$ fathoms at low water, with Chifu peak N.W. by N.; Sentry rock N.E. by E. $\frac{1}{2}$ E.; the lighthouse E. by S. $\frac{1}{2}$ S.; and Knob point S.S.E.

If working in for this harbour from the eastward, North rock, Double and S.E. islands may be safely approached to half a mile on the one side, and the mainland on the other, until the soundings decrease to $4\frac{1}{2}$ fathoms, the water gradually shoaling as the shore is approached. Between the islands and Knob point is the Kung-kung flat, having in one or two places 4 fathoms at low water springs, rather near to the island, but a general depth of 26 feet.

As the East sand pit extending from Kung-kung tau is approached, remember the bearing of the hill over Knob point, W. by S. $\frac{1}{2}$ S., and do not go northward of that bearing until the clearing mark, Stick-up rock and the Mound, comes on. When the spit is cleared a longer stretch may be made on the port tack, taking care not to approach the mound nearer than to bring S.E. island E. $\frac{3}{4}$ S., when it will be seen over the sandy flat between the two portions of the island. This line will clear the West sand spit, the south extreme of which bears from the centre of Mound S. by E. $\frac{1}{4}$ E. nearly three-quarters of a mile, and W. $\frac{1}{4}$ N. from the lighthouse.†

Approaching from the westward Chi-fu peak, 980 feet high, and the land of the peninsula will show out conspicuously, appearing from a distance like an island, the low sandy isthmus connecting it with the mainland not being visible. There are no hidden dangers known in the vicinity. Three or four detached rocks are dotted along the face of the peninsula, but they are all well within half a mile of it, and above water, so that a

* Navigating officer, H.M.S. *Sheldrake*, 1878.

† *See* Sketches of these leading marks on Admiralty plan of Chifu or Yentab harbour, No. 1,263.

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course a mile off and parallel to the shore clears everything. Sentry rock, lying off the cape, may be rounded at 2 cables' distance in 7 fathoms and the anchorage steered for.

If intending to anchor under the Kung-kung islands, after rounding Sentry rock, steer for Knob point until the clearing mark for the West sand spit (the lighthouse bearing East) comes on; then run in southward of that line and anchor as convenient.

CHIFU BLUFF, $2\frac{3}{4}$ miles N.W. by W. from Chifu cape, is a precipitous cliff immediately under the summit of the peninsula. The western extremity of which is $2\frac{1}{4}$ miles farther W.S.W., with a high rock off it. The sea face of the promontory is extremely bold, and may be approached within a quarter of a mile in from 9 to 12 fathoms.

The COAST westward of Chifu peninsula falls back southward, forming a sandy bay, terminating at Sloping point, 11 miles N.W. by W. $\frac{1}{4}$ W. At 11 miles farther in the same direction is Low point, distinguished by a conspicuous nipple or small mound upon it, 250 feet high; and between the points are two other bays. At 8 miles westward of Low point is Teng-chau head of about the same height, around which are steep cliffs.

TENG-CHAU,* a city of the second class, is commanded on three sides; the rising ground of Teng-chau head overlooking it on the west. A small detached fort, unarmed in 1860, also stands outside the walls to the west. The city is surrounded by rather a formidable looking wall, but without guns; an opening in its sea face forms the entrance to a small camber, in which a fleet of junks lie closely packed and sheltered from all winds; its entrance, only accessible to sanpans or small junks according to the time of tide, is so shallow that a very moderate sea breaks across it.

The little camber is a scene of bustling activity in summer, some junks taking in cargoes of grain. Coal is occasionally imported from Fu chau. The shops in the city appeared to have little else for sale than the usual description of grain and dried peas. No supplies can be obtained here.

Water.—A small stream of water empties itself into the camber at Teng-chau, but its purity may be doubted, as it seems to run through a large and populous part of the city.

TENG-CHAU BANK.—This dangerous bank, which extends in a W.N.W. direction 7 miles from Teng-chau head, with a general depth of 2 to 4 fathoms on it, is apparently of sand and rock, with several small knolls and large shelfs of shallow water. The outer knoll, of 2 fathoms,

* *See* Admiralty Chart of Pe-chili strait, with Miau-tau islands, No. 1,392; scale, $m = 0{\cdot}4$ of an inch. Teng-chau was the port opened by the treaty of Tientsin, but being unfitted for trade, Yen-tai, or Chifu, was substituted.

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lies on the above bearing and distance, and just midway between the coast and the high bluff on the west part of Ta-hi-shan, the western of the Miau-tau islands, which bears from it North, 6 miles. This knoll and a 3-fathoms patch 1¼ miles South of it are the outer dangers lying on a 3 to 4½-fathoms bank, with 6 fathoms on its edges. A series of shoaler patches, on which are several knolls of 4 to 6 feet, extend about 5 miles from Teng-chau head.

DIRECTIONS.—If intending to anchor off Teng-chau, after rounding Low point steer W. ½ N., and when Teng-chau head bears W.S.W. stand in and take up anchorage in 3 to 6 fathoms. But if running westward be careful not to bring the nipple on Low point to the eastward of E. by S. ¾ S., to avoid a dangerous rocky ledge extending nearly a mile off a low point of the shore, and the extremity of which is 2¼ miles east of Teng-chau head. This reef partially protects the anchorage from the eastward, as Teng-chau bank does from the westward, but it is entirely exposed to the northward, and these winds sends in a heavy breaking sea, which renders the anchorage unsafe, and communication with the shore impossible, the Miau-tau group being too distant to afford any shelter.

The MIAU-TAU or Meih-shan islands, in all fifteen, exclusive of small rocks, extend 35 miles in a northerly direction from Teng-chau to within 22 miles of the extremity of the Liau-ti shan promontory on the north side of Pe-chili strait, and they separate the Yellow sea from the gulf of Pe-chili. The four northern islands form a group, the peak of the northernmost being in lat. 38° 23′ 37″ N., long. 120° 55′ E. The southernmost islands form a compact group, 9 miles in extent, enclosing the anchorage known as Hope sound, where the British fleet under Vice-Admiral Sir James Hope, K.C.B., assembled in 1860. The intervening islands and rocks are isolated and scattered.

There are several passages through the islands. Miau-tau strait, between the south part of the group and the mainland, has generally been used by vessels bound into the gulf of Pe-chili; but if not intending to anchor off Teng-chau, or among the southern island of the group, there are much better and more direct channels north of Chang-shan island.

The Chang-shan channel, (called by the Chinese Pau-tau mun or Pagoda gate,) between the north side of Chang-shan and Houki island, is decidedly the best, and may be taken at night if the islands can be seen. In fact, with the exception of the Hesper and Fisherman rocks in the north Toki channel, and a reef extending a mile southward from Sha-mo island, the whole of the entrances northward of Chang-shan appear to be remarkably clear of danger.

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There is also an excellent passage between Kas-shau and Houki islands, known as the Kao-shau channel (passing south of Siau-chu-shan), which is used by many steamers bound to the Peiho. Great caution however is necessary in foggy weather or dark nights, as the current in the vicinity has been reported on one occasion as running 5½ knots to the south-eastward.

In the eastern part of the deep narrow passage between North and South Hwangching islands, a small rock dries 6 feet at low water in mid-channel and there is another of the same height at three-quarters of a mile from the north-east shore of North Hwangching. A reef, also with a flat rock on it, extends a quarter of a mile from the north-west point of South Hwangching.

The passage south of Toki, the central island, and north of Sha-mo is called the Chin chu mun or Pearl gate. The Liau-ti-shin channel, north of all the islands, and which is 22 miles wide, is supposed to be clear of all hidden danger.

Supplies.—On the first appearance of the surveying squadron in the southern part of the Miau-tau group in June 1860, all the cattle in Chang-shan and the islands in the immediate neighbourhood were concealed, and eventually, during the stay of the vessels, removed either to the mainland or the northern islands. A few pigs were procured; also a small quantity of poultry. H.M.S. *Renard*, during her stay in Hope sound, obtained a good supply of vegetables, and frequently sheep were brought from the mainland.

Toki, which lies nearly in the middle of the chain, although not the largest island, appears to be the most productive. At the anchorage on its south side, H.M.S. *Wellesley* in 1840 obtained about 50 bullocks, and a supply of eggs, poultry, and vegetables. The *Cruizer*, in 1859, was supplied with 11 bullocks, and some vegetables.

The villages on the south part of the Miau-tau group appear to have a better supply of water than is usually found along the coast of the mainland. The village on the north part of Miau-tau has four wells. At Toki the *Wellesley*, in August 1840, procured 30 tons of water in one day from the wells of the village on the south side of the island. In April 1860 it was with great difficulty that the *Actæon* obtained 5 tons with two pinnaces in one day. A better supply may probably be found at a later season of the year.

HOPE SOUND.*—There are two or three anchorages among the islands forming the southern part of the Miau-tau group. The best is in

* *See* Plan of Hope sound on Admiralty Chart of gulfs of Pe-chili and Liau-tung, No. 1,256; scale $m = 0 \cdot 9$ of an inch. Also Admiralty Chart of Pe-chili strait and Miau-tau islands, No. 1,392.

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Hope sound, which is formed on the west and northern side of Miau-tau or Temple island, and is sheltered on the east by that island and Chang-shan, on the north by Chang-shan and Siau-hi-shan and some rocks between them, and on the west and south-west by Ta-hi-shan and a reef extending from it to the south-east. Having several entrances, even sailing vessels under all circumstances of wind and tide may freely run in or out.

Hope sound, however, can only be considered as a summer anchorage, at which season ships of any draught and in almost any number may lie quite sheltered, so that even boat work would be seldom interrupted; but it is a thoroughly bad anchorage* in winter when northerly winds are prevalent. The only secure part then is Charybdis harbour formed in the north-east part of the sound by the north end of Chang-shan and a small island adjoining. All the rest of the sound at this season is shoal where well protected, and ill protected where it is deep. Another disadvantage is, that the eastern stream not having space to pass to the eastward through the narrow part of Miau-tau strait, finds its way to the northward through the sound, and in northerly winds causes vessels to lie broadside to the swell. According to another account† Hope sound is a wild and dreary place in winter, and although sheltered sufficiently for security, such a heavy sea sets in with northerly gales that when riding with the swell on the beam (caused by the strong north-western tidal stream) the rolling is so great as to endanger masts and boats, and cause serious wear and tear. In one gale H.M.S. *Urgent* rolled her quarter boats under water and lost them, and at the same time one gunboat and three junks were driven ashore. Snow storms occur with the wind from North blowing with a force of 10 to 11; barometer 30·60 and the thermometer 16° and the cold piercing. The inhabitants have always proved friendly and willing to afford supplies.

CHARYBDIS HARBOUR is one mile in length in a north and south direction and about 4 cables broad, its eastern side is fringed by a shoal, which commencing at the north-west point of Chang-shan, extends in a southerly direction and surrounds the island of Miau-Tau. In the south part of the harbour this shoal extends westward a distance of 3½ cables, the west extreme being marked by some rocks above water.

Observatory island is 3 cables long in a north and south direction, about 1½ cables broad, and 280 feet high; from the south point of the island a sandy spit extends 2½ cables to the southward. From the north-east part of the island rocks above water extend 2 cables to the north-eastward; these rocks stand on a shoal flat which skirts the east side of the island at

* Commander J. G. Goodenough, H.M.S. *Renard*, January 1861.
† James S. Watts, Esq., Master R.N., H.M.S. *Ringdove*.

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a distance of 2 cables, and continues to the south of Spit point a distance of one cable.

The available anchorage ground in the harbour between the fringing shoals is thus narrowed to a width varying from 2 to 3½ cables, and has a depth of 4 to 7 fathoms, stiff mud. The deeper water is in the northern part of the harbour.

Charybdis harbour may be entered from north or south; it affords a secure anchorage at all seasons of the year, and is protected from all winds by the surrounding islands and rocks. Northerly winds, to which the harbour is slightly exposed, create a ground swell, but not sufficient to inconvenience a large vessel.

H.M.S. *Charybdis* anchored in 4¾ fathoms with N.W. point bearing N. ½ W.; Joss house N.E. ½ E.; and Cairn hill East. There is sufficient room for two large vessels and four small vessels to lie at single anchor. It is advisable to moor, however, as vessels are generally tide rode, and seldom swing to the wind.

Tides.—It is high water full and change in Charybdis harbour at 10h. 30m.; springs rise 9 feet. In the harbour the flood stream sets to the northward and the ebb to the southward.

Landing can be effected at any time. The natives of the village on the east side of the harbour are civil; but no supplies, with the exception of rock oysters and a few fish, could be obtained.*

Other Anchorages.—In Chief bay, on the south side of Toki, there is anchorage in 6 to 9 fathoms, well protected from the northward and westward, but quite open to the southward.

H.M.S. *Wellesley* in 1840 anchored in 12 fathoms under Kao-shan or Quoin island during a strong northerly wind, with the island bearing from North to N.N.E. ½ E. about a mile distant.

TA-CHU-SHAN, or Great Bamboo island, the easternmost of the Miau-tau group, is 480 feet high, and visible in clear weather 30 miles. Although of a barren appearance there is a village on its south-eastern side, and cattle were observed on the sides of the hills. The island is bordered by a white shingly beach, and appears bold-to. The spit on its south side should not be approached closely at night, for at certain times of tide an eddy is formed there which sets towards the island.

CHANG-SHAN, or Long island, the largest of the Miau-tau islands, is 7 miles in extent N.N.W. and S.S.E., and divided into two parts by a narrow isthmus of shingle nearly a mile in length. Its east and north

* From information furnished by Navigating Lieutenant B. S. Bradley, H.M.S. *Charybdis*, 1876.

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sides, bold and cliffy, are steep-to, and Cairn hill, the highest on the northern part, rises to 570 feet. The southern part of Chang-shan is also hilly, its south and centre hills being each 490 feet high.

Chang-shan Tail, a sandy spit, extends South upwards of half a mile from Spit point, its south extreme, with irregular soundings of 4½ and 2 fathoms to the southward, the latter depth being nearly 1¼ miles from the point. The Tail shows at low water; a tidal overfall is very perceptible on it, and continues so for a considerable distance across the strait, like breakers, far to the southward of real danger. H.M.S. *Furious*, April 1858, grounded at 1¼ miles from Spit point, with the east extreme of Chang-shan just shutting in with the south extreme, bearing N. ¼ E. and the western end of Ta-hi-shan N.W. by W.; the vessel appeared to have grounded on its southern limit, having 2½ fathoms at her bows and amidships, and 5 fathoms under her stern.

A small round hill, with a heap of stones on it, forming the extreme of the land to the north-eastward of the village on Miau-tau, kept open of Ship point (a low bluff of a reddish colour forming the west extreme of the south part of Chang-shan), N.N.W. ¾ W., leads in 5 fathoms water to the south-west of the spit. The above hill is low, and to the north-east of the village is a higher hill, having also a heap of stones on its summit.

TA-HI-SHAN and SIAU-HI-SHAN, or Great and Little Black islands, are to the westward of Chang-shan, and between the former and Chang-san is the small island Miau-tau or Temple island, 310 feet high, on the north-west side of which is Hope sound, which as before stated, is the best and most sheltered anchorage among the Miau-tau group. The western point of Ta-hi-shan is a stupendous bluff, with cliffs 600 feet high.

A rock 25 feet high lies N.N.E. 1¼ miles from the north point of Siau-hi-shan. It is shoal all round and should not be approached nearer than 3 cables. The flood stream sets past the rock about E.S.E. and the ebb about West. Tide rips extend the whole distance between it and Ellis island,* and the passage between them is unsafe.

TOKI TAU, about 10 miles northward of Chang-shan, and readily distinguished by its peak, 613 feet high, is in the form of a right angled triangle, the shortest sides of which face the south and west. There are four villages on its southern side, and one or two on the north-east side. It is well cultivated, and fresh provisions and water may be procured.

The whole of the southern part of Toki appears clear of danger. The small rock off its south-eastern point, and Mochang-shi islet off its south west end may be passed at a cable.

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* Remark Book of Lieut. C. Jackson H.M.S. *Sheldrake*, 1878.

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HOUKI and KAO-SHAN.—Kao-shan or Quoin island, 650 feet high, lying nearly 5 miles W.S.W. of Toki, is a remarkable little island, in form like a gunner's quoin, with its highest part on the south. Houki island 4 miles to the southward, and 310 feet high, has a reef extending some little distance from its northern side, and another off its eastern end.

LIGHT.*—HOWKI ISLAND.—A revolving *white* light is exhibited from a lighthouse 46 feet in height on the summit of Howki island visible all round. It is elevated 328 feet above the sea and should be seen in clear weather 24 miles. The intervals between the flashes are half-minute. The illuminating apparatus is dioptric of the first order. The tower is painted *black* and the keepers' dwellings *white*.

Fog Signals.—During thick or foggy weather—should a bell, fog horn, steam whistle, or other sound be heard, indicating the proximity of a vessel—*two* guns will be fired with an interval of *two minutes* between them; and if the vessel's fog signal is still heard, the firing will be repeated after an interval of *ten minutes*.

NOTE.—This light will not be exhibited between the 16th of December and the 1st of March inclusive.

Position.—Latitude, 38° 4′ N.; longitude, 120° 39′ E.

Hesper rock was discovered by H.M.S. *Nimrod*, June 1859, and its position was subsequently fixed in July by J. Loane, Master, R.N., commanding H.M.S. *Hesper*. It is only about 30 yards in extent, east and west, and 8 or 10 yards wide, and when first seen, bearing E. ¾ N., it had the appearance of a wreck or abandoned vessel with her timbers showing above water.† It dries from 4 to 6 feet at low water springs, and is scarcely covered at neaps; at the highest tides a break or mostly a ripple, visible in daylight and clear weather, shows its position. The *Hesper* passed its south and south-east sides at the distance of 3 cables, in 12 fathoms water. From the rock the west extreme of Ta-kin bears N.N.W. ½ W.; the summit of Kao-shan West; and the highest part of Ta-chu-san S. by E. Great caution should be used in approaching this locality at high water.

Fisherman Rock, lying nearly in mid-channel between Toki and Ta-kin islands, is seldom visible, being only just awash at low water springs. A ripple generally shows its position during both flood and ebb streams when the sea is smooth, but when the streams are slack, no signs of it appear. From the rock, the east extreme of Ta-kin appears just

* Chinese Light List, 1884.

† Lieutenant Bullock, commanding H.M. Surveying-vessel *Dove*, 1860, remarks:—"We were much struck on passing, the day being calm, with the treacherous appearance of this rock, which looked like a brown floating log, and might easily have been passed unnoticed."

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touching the west extreme of North Hwangching N.N.E. ¾ E.; Kao-shan is just seen over the north extreme of Toki, S.W. by W.; and the western side of Sha-mo is in line with the centre of Siau-chu-shan, S. by E. ¼ E.

TIDES.—It is high water, full and change, in Hope sound, Miau-tau group, at 10h. 24m., and springs rise 6 feet, but the rise is much affected by strong winds. At Depôt bay at the south end of Miau-tau and at Ship point, Chang-shan, it is high water respectively at 11h. 4m. and 11h. 33m. For some distance eastward of Miau-tau strait the flood tide sets westward, and the ebb eastward; but within the strait, a few miles west of Teng-chau, the flood will be found setting eastward, and the ebb westward. *See* current arrows on Admiralty Chart.

DIRECTIONS.—When bound through Miau-tau strait from the eastward, keep Island head open eastward of Spit point (Chang-shan), bearing about North until the north point of Miau-tau is seen clear of Ship point, N.N.W. ¾ W. This latter line of bearing clears Chang-shan Tail, when the course may be altered to the northward for the anchorage on the south side of Chang-shan. Or should the anchorage in Hope sound be preferred, after rounding the Tail, steer N.W. by W. ¾ W. until Ellis island is just seen clear of Club point, about N. by E., then run in on that line and anchor, with Cairn hill, the northern summit of Chang-shan N.E. by E., the temple on Miau tau, E. ¾ S., and the summitt of Siau-hi-shan N.W. ½ W., or as near to this position as circumstances will allow. A good spot to anchor in is southward of the east end of Siau-hi-shan, and as close in as the vessel's draught will admit. The bottom, as is generally the case on this coast, is stiff mud, and anchors therefore hold well.

If intending to pass through the strait without anchoring, after clearing Chang-shan Tail, keep on the north side of the strait in 6 or 7 fathoms, and be careful of getting into 10 and 12 fathoms, as the deepest water borders the Teng-chau bank, to avoid which, Teng-chau head should not be brought eastward of S.E. by E. until the west end of Ta-hi-shan bears eastward of North, when a N.W. by N. course may be steered for Sha-lui-tien island distant 112 miles.

Vessels bound to the Pehi-ho or other ports in the Gulfs of Pe-chili and Liau-tung, are recommended to use the Chang-shan channel on the north side of Chang-shan, the course and distance from 2 miles outside of Alceste island to the middle of which, is W.N.W. 100 miles. The channel between Toki and Ta-kin cannot be recommended to a stranger on account of the Fisherman rock; but if compelled to take it and intending to pass northward of the rock, do not bring the south end of Ta-kin to the northward

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of N. by W., until Kao-shan opens West of Toki. In passing southward of the rock do not bring the northern point of Toki south of West until its eastern point bears south.

There is a narrow, deep channel between North and South Hwangching islands, but at its east entrance, nearly in the centre, is the rock which dries 6 feet at low water, and is therefore, nearly always visible.

NORTH COAST OF YELLOW SEA.

The northern coast of the Yellow sea is fronted in some parts by large groups of islands; but as yet it is little known to Europeans. From Liau-ti-shan head, the south extreme of the province of Liau-tung, it extends upwards of 200 miles, first in a north-easterly, and then in an easterly direction, to near the meridian of 125° E., when the coast line takes a southerly direction and forms a great concavity between Liau-tung and the western coast of Korea.*

In September 1840, H.M. ships *Blonde* and *Pylades* visited this part of the coast, and determined the position of several points on their route. Subsequently in 1860, the coast from Liau-ti-shan to the eastward of Ta-lien-whan, and the chain of islands as far as Hai-yun tau, was surveyed by H.M.S. *Actæon* and *Dove*.

YA-LUH KIANG.—This river separates the province of Shing-king or Liau-tung from the Korea, which bounds it on the east, and of which it is the most considerable stream, being 200 miles in length. Its estuary, the mouth of which is in about lat. 39° 33′ N., long. 124° 33′ E.,† here the river discharges itself into the head of the Whang-hai, having high land east of its left bank. There are two islands lying in a W.N.W. direction, some 30 miles from the mouth of the river, and 5 from the entrance of the Ta-yang-ho, viz. :—Siau-lu-tau, the eastern, and Luh tau,‡ the western; between these is the Ta-yang-ho bar, and shoal water surrounds the southern coast of the latter, extending for over 3 miles from the shore.

Fung-hwang-ting, the frontier town, lies near the Ya-luh kiang, and commands all the trade with Korea, which is obliged to pass through it.

TA-KU-SAN and TA-YANG HO.§—About 40 miles westward of the Yalu-kiang, which separates Korea from Liau-tung, is the

* The southern coasts of the Korea are described in the *China Sea Directory*, vol. iv.

† According to Admiralty Chart No. 1,256, lat. 39° 56′, long. 124° 18′, and also the Rev. Alexander Williamson, who visited this coast in 1867.

‡ Great Deer and Little Deer islands.

§ From "Notes on Manchuria," by the Rev. Alexander Williamson, B.A., published in the "Journal of the Royal Geographical Society," for 1869.

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entrance of the Ta-yang ho, on which river at 12 miles from the sea is the town of Ta-ku-schan, in lat. 39° 55′ N., long. 123° 34′ E.* It is the seaport next in magnitude to Yingtse (Newchwang), and like that place possesses many large native warehouses, and is the medium through which a tremendous amount of produce from the north is exported. It competes with Yingtse in soliciting the trade in pulse and beancake, but is not likely to succeed. At the same time great quantities of goods were met on their way to this port, which, as far as could be judged, could as easily have been conveyed to the other. There was a great amount of native shipping in the harbour, but chiefly junks of second and third class. Timber is supplied from Ta-ku-san to all the ports of China northward of the Yangtse. The approaches to this river are shallow, and large vessels can only approach to within 6 miles of the entrance. About 4 miles off the entrance are two small islands, namely, Ta-lu-tau on the south side and Siau-lu-tau on the east side; the channel into the river lies between these two islands; the channel west of Ta-lu-tau is not practicable even for boats. The German vessel of war *Ariadne* was piloted to an anchorage in 4½ fathoms, 1½ miles S.E. by S. from the peak of Ta-lu-tau; shoal water extends south and west of Ta-lu-tau a distance of over 3 miles. A depth of 4 fathoms is found at 3½ miles S.W. of the island.

† From the entrance the river Ta-yang-ho trends first north-westerly and then north-easterly to the town of Taku-schan (Great Orphan mount), which is situated on the right bank of the river, about 8½ miles from the entrance and at the foot of a steep mountain, 984 feet high, which is easily recognised by a wooded ravine on the seaward side. Above the town the river trends easterly and receives the name of Sian-yung-ho. It has many tributaries, and is said to rise in lat. 41° N., long. 123½° E. in the province of Sing-king or Mookden.

The boats of the *Ariadne*, in July 1876, ascended this river without difficulty as far as the town of Taku-schan. A depth of 1½ feet was found on the bar at low water, but it is considered possible that the bar may dry at low water spring tides. Inside the bar the least water found was 7 feet, with a general depth of 8 feet. At the anchorage off the town there is a depth of 8 feet at low water, bottom soft mud, on which vessels drawing less than 10 feet may ground. The banks of the river from the entrance to the town of Taku-schan are low and in some places submerged at high water; the stream is 330 yards wide at the town.

Spring tides rise 20 feet. (*See* also Tides, pages 589, 591, 593).

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* From Admiralty Chart No. 1256.

† *See* Admiralty Chart:—Gulf of Pe-chili and Liau-tung, No. 1,256.

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The population of Taku-schan consists of 30,000 or 40,000. Commerce with Korea, prohibited previous to 1873, has commenced, and is at present very active.

The exports consist chiefly of bean cake, and timber. Silk of a coarse inferior quality is exported in small quantities.

From two to three hundred large junks arrive annually, of which number, sixty are from Shanghai and the remainder from the towns of the Shangtung promontory. The larger junks seldom cross the bar, but anchor under Ta-lu-tan island, and land or discharge from lighters; the smaller junks ascend the river to Taku-schan.*

The river is frozen over from the end of November until the beginning of March.

The intervening coast between this and the Korea is reputed to be a coal district. A great road runs from Ta-ku-san to Pi-tsze-woa, 80 miles to the south-westward and also eastward to Fung-whang-ching, the gate of the Korea.

From Ya-luh kiang the coast trends W.N.W^{d}. for 40 miles to Ta-lu-tau, and from thence W.S.W^{d}. for 75 miles to Yen-toa bay. In this distance are six rivers; the Ta Yang-ho; the Lung-tai; the Siau-sha; the Ying-ma; the Ta-chwang (represented with a large estuary), and "Small river." The coast appears to be hilly. Ko-li tau (apparently a small island) is the northern of several large groups, called Blonde archipelago, lying eastward of Yen-toa bay.

PI-TSZE-WOA is another harbour of some note in lat. 39° 18′ N., long. 122° 18′ E. This port is situated on the sea, at the entrance of the most western of the above named rivers, and the harbour is pretty well defended from all winds by a series of rocks, which form a semicircle round it. Unfortunately, the water is shallow, and many of the junks are left high and dry when the tide is out. This could be remedied by a pier, and it would be worth while to construct one, for this place has the great advantage of being open all the year round. The warehouses here are also large, and the import and export trade considerable.

Pi-tsze-woa is placed by Mr. Williamson 6 miles N.N.W. of the island Kwang-lo-tau, and 12 miles north-eastward of where the Admiralty survey terminates. From this town the great road to Yingtse strikes across the peninsula, west-north-westward to the head of port Adams, which is 18 miles distant.†

BOURCHIER GROUP, the northern and eastern of these groups, consists of one large island and five smaller ones lying to the north

* Annalen der Hydrographie, Berlin, heft 5, 1876.

† From "Notes on Manchuria," by the Rev. Alexander Williamson, B.A., published in the "Journal of the Royal Geographical Society" for 1869.

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and north-east of the large one, and off a projecting point of the coast, where there is a high hill. The southernmost island is barren, with sharp pointed rocks off its south point like the Needles (Isle of Wight), over which rises a lofty hill, having two sharp peaks of unequal height, (about 1,000 feet,) which are readily recognized at a great distance except on a N.N.E. bearing, when they are in line. The *Blonde* passed the southern point of this group at a mile, in 18 fathoms, and anchored in 12 fathoms, with the peak bearing S.W. 2½ miles. The island or rock Tsiang-keun shih* lies to the east or north-east, 10 or 12 miles, bounding the large groups on the eastward. It was not sighted by the *Blonde* or *Pylades*.

PYLADES SHOAL.—The *Pylades* anchored for the night north of the Blonde group, where some patches of sand were found with depths of 15 and 17 fathoms on them; the mainland at this time being 18 to 21 miles distant. The next day at noon, in lat. 39° 2′ N., long. 124° 33′ E., the main land was lost sight of at 21 or 24 miles' distance. There was at this time a patch of low islands in sight, bearing N. by W. 10 miles, and a number of high islands, the eastern extreme of which bore S.E. by E. 16 or 18 miles.

After steering S.S.E. from noon, at the rate of 7 knots, at 12h. 50m. the water suddenly shoaled from 15 to 7 fathoms, rocky bottom. Hauling off immediately W.S.W., it soon deepened to 22 fathoms; when the course was again steered as before, and in a short time it shoaled to 17, 10, 7, 6, and 4 fathoms, when the ship was hauled off. From the broken water and the number of birds, it was supposed that there must be much less than 4 fathoms on this shoal; it appeared to extend in a N.N.E. and S.S.W. direction, in lat. 38° 56′ N., long. 124° 31′ E.

HAI-YUN-TAU, 5 miles in extent north and south, lies isolated at the south-east part of the Blonde archipelago. The summit of this island is a gently sloping peak, 1,320 feet high, bounded on the south by a high broken cliff; and from which a ridge runs to the north, on which are two conspicuous rocky peaks; another ridge to the N.N.W. encloses Thornton haven. The northern point of the island, Gardiner island, 350 feet high, is a promontory detached at high water. E.N.E. 1⅓ miles from the latter, is Arch rock, 50 feet high, so named from a natural arch through it, open in an E. ½ N. direction. There are 25 fathoms between it and Gardiner; and the passage also appears clear inside Bessie island lying 1¼ miles off shore, to the south-east of the centre peaks. This small island has three hills on it, and lies east and west: a rock was seen breaking about a quarter of a mile south-west of it. Hai-yun tau is more or less bordered by

* *Shih* signifies *stone*. In the local dialect *tau* or island is hereabouts pronounced *do*, thus:—Hai-yun-do, Che-do, &c.

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cliffs. This island should be rich in iron as magnetic observations are considerally affected.

Chen-t'ien Rock is a sunken danger lying about 1¼ miles westward of Hai-yun (Hai-yang-tao) island, approach to Thornton haven :—

This danger on which H.I.C.M.S. *Chen-tung* grounded on 13th May 1880, is about 30 yards square, with 5 feet on its shoalest pinnacle, 7 to 8 fathoms close-to, and 21 fathoms around. It lies with the following bearings, viz. :—

Zöe head - - -	N. 31° E.
South extreme Hai-yun island -	S. 67° E.

THORNTON HAVEN* is an inlet formed by a long spur from the summit, nearly enclosing a concavity in the western side of Hai-yun tau. It is 2 miles in length, but its head or southern part is very shallow. The entrance is half a mile wide, between Zöe head, a bluff, 395 feet high, on the north, and a much lower point on the south, having a pinnacle rock off it, on a projecting ledge, which can be passed at a cable. A small vessel may find shelter in 3½ to 4 fathoms, land-locked, and although it is very probable a westerly gale would send in much swell, which the eastern beaches seemed to indicate, there is not a long fetch from West or W. by N., the direction to which it is most exposed; south-west gales are unknown, and in summer the swell is usually from S.E. or South. The head of the bay has a stony bottom, covered with long grass.

Fresh water was easily procurable in July, at one or two small streams at high water. There is a small village at the head of the bay, inhabited by Chinese, who said the island belonged to Korea, and was called Ho-i-shan tau.

TIDES.—It is high water, full and change, in this haven, at about 9h. 30m., springs rise 12 feet, neaps 8 feet. The day tide in July rose 3 feet higher than the night tide.

Supplies.—The inhabitants of Hai-yun tau are very poor, but were ready to part with the few fowls and vegetables they had. In summer these islands are used for pasturage, and cattle are brought over from the main-land to graze.

YANG TAU, or Wu-ma tau, is the largest island of a group lying N.N.W. ½ W. 14 miles from Hai-yun tau peak, and 13 miles N.E. of the Blonde group. It is a conical hill about 600 feet high; and one or two miles to the north and north-east of it, are four rocky islands, low and hummocky. Yang tau signifies Sheep island.

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* *See* Plan of Thornton haven; scale, $m = 3$ inches, on Admiralty Chart of gulfs of Pe-chili and Liau-tung, No. 1,256.

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The BLONDE GROUP, or Wai-chang shan,* lying about 45 miles eastward of Ta-lien-whan bay, consists of one large island and four smaller islands north-eastward of it. They are all much the same in character; undulating ridges with deep ravines, bordered with high cliff or ragged shores, but destitute of any prominent feature when seen from a distance.

Siau-hau do, the eastern island, lying 12 miles West of Hai-yun tau is composed of high ridges, the southern part having a peak 600 feet high. The north-east point is a high bluff bounded by cliffs its whole height. A narrow descending ridge runs to the north-west of the island, terminating in a long sharp point, the outer part of which is nearly detached, and off which is a tide race. On the western side of the island are two rocky bays; and there is a rock awash 2 cables off its south-west point, which may be safely passed at 4 cables.

Ta-hau do, the centre island of the group, lies W.S.W. a mile from Siau-hau do, with a good passage of 17 to 20 fathoms water between. The island is very steep on all sides, with the exception of its low, sharp eastern point. Its south point is a bluff 600 feet high, with high cliffs; and lying half a mile South of it is Pyramid rock, 120 feet high, which is connected to the point by a reef, many parts of which dry at low water. Peaked rock has two pointed summits, the highest and most northern of which is 50 feet high and lies E.S.E. $1\frac{3}{4}$ miles from Pyramid rock, and S.S.W. $1\frac{1}{3}$ miles from Siau-hau do.

Ta-lin tau and **To-sa tau,** the two northern islands, lie close together east and west. The passage between them has an islet in it and is choked with reefs. Both are much lower than Ta-hau do, off which they lie north-westerly three-quarters and $1\frac{1}{2}$ miles respectively, the channel between being deep.

Chang-zu do, or Ika-tau,† the largest island of the group, lies to the south-westward of the others, with a passage 3 miles wide between. The two central hills of the island are about 800 feet high, with a deep valley between them. The north-eastern shore is somewhat low, and divided into two bays. The south shore is bold-to and may be passed at 2 cables.

All the passages amongst the Blonde islands, except that between Ta-lin tau and To-sa tau, seem clear of danger with 18 to 20 fathoms water, excepting off the north point of Chang-zu do, from which extends a large dry reef, off which there is some rocky ground with a rock awash half a mile from the shore.

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* Wai signifies outer; Li, inner.

† Nearly all these islands appear to have two names, one Chinese, one Korean.

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SHI-SIAU, is a remarkable rock lying S. by W. $4\frac{3}{4}$ miles from the east point of Chang-zu do. It is about 40 feet high, appears like a junk under sail, and can be seen 12 or 15 miles off. It stands on a flat rocky ledge which extends from it about 2 cables. The *Pylades* passed inside it, and had no bottom with 30 fathoms.

ANCHORAGE.—Shelter from northerly winds may be obtained in 8 to 12 fathoms, at 2 or 3 cables off the south shore of Ta-lin tau. Also in a small bay on the west side of Ta-hau do, in 9 or 12 fathoms, but this is a bad anchorage and affords but little shelter. Probably also in the bays on the west side of Siau-hau do, but these appear rocky and uninviting.

The *Blonde* and *Pylades* anchored off the north-eastern of the two bays on the north-east side of Chang-zu do, in 17 fathoms, mud, sheltered from all but northerly and south-east winds. Stock of every description and vegetables were abundant. The *Dove* anchored, July 1860, in the bay on the west side, where shelter can be obtained, except between N.N.W. and South, in from 7 to 10 fathoms.

Supplies.—The *Dove* found it difficult to obtain water in the western bay, but there are fresh water streams in all the ravines. Fowls, eggs, pigs, and vegetables were procurable in small quantities, in fact as much as the inhabitants could spare.

TIDES.—In the bay on the west side of Chang-zu do, it is high water, full and change, at 9h. 30m.; springs rise about 12 feet, neaps 8 feet. The tidal stream runs strong between the islands of the Blonde group. During the first two hours ebb, it ran to the westward about $2\frac{1}{2}$ knots per hour, on the change day. There is a tide race off the north point of Chang-zu do, and another 3 or 4 miles west of that island, over 17 to 20 fathoms, rocky bottom.

ELLIOT GROUP, or Li-chang-shan, is an irregular chain of islands and rocks, 15 miles in extent east and west. The eastern island, Baka tau, is $8\frac{1}{2}$ miles north of Ta-lin tau, with depths between of 17 to 24 fathoms, rock and sand, the deepest water being near the former. There is a patch of 12 fathoms, rock, N. by E. $\frac{1}{2}$ E. 3 miles from the double hill of Ta-lin tau. The east point of Baka tau is a cliff at the termination of a range, and lies east $1\frac{1}{4}$ miles of its summit, which is about 600 feet high.

Passing east of Ba-ka tau, the *Blonde* and *Pylades* proceeded to the northward, towards the coast, shoaling from 15 to 9 fathoms, and the high land being then distant 12 miles, they hauled to the eastward. There was observed on the main something like a fort or town at the distance of 15 miles, the coast line trending to the N.E. The flood tide here set strong to the northward, $3\frac{1}{2}$ knots an hour, and the ebb faintly to the eastward.

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There are several small islands to the westward of Baka tau, between it and the largest island of the Elliot group, the southern face of which runs 3½ miles south-west to Hill point, a nearly detached head, and then the same distance north-west. On the south-western side of this large island is a deep bay, at the mouth of which is Black rock, a square rock, 70 feet high, with a rock awash 2 cables N.W. of it. Flat rock, 25 feet high, lies 1⅓ miles West of Black rock, and 6 cables S.S.W. of the west point of the island. Wooded island, small and 200 or 300 feet high, is 6 miles W. ¼ N. from Hill point, and a quarter of a mile off the south point of an island which lies south of a great break in the Elliot group, in the centre of which break, and 3 miles north of the west part of Wooded island, is a high rugged rock.

Five-rock point, the south-western extreme of the Elliot group, is W. by N. ¾ N. 4½ miles from Wooded island. This point is rendered very conspicuous by an even chain of large rocks running off from it. Castle rock lies 1½ miles North, and the Twin hills N. by E. 4½ miles from it.

KWANG-LO TAU, 5½ miles in extent, N.E. and S.W., lies westward of the Elliot group. Its South cape, bearing N.W. by W. ¾ W. 18 miles from Chang-zu do, has a sugar-loaf peak rising 900 feet precipitously from the sea, one mile S.S.E. from the higher summit of the island, a rocky mountain. The remainder of the island is of irregular shape, much lower, and undulating.

Off its South cape, a little eastward, is a nine-pin rock, and E. by N. ½ N. half a mile a rock which covers. East of this, on the south side of the island, is a bay with several rocks off its shores; and 4½ miles E. by N. ½ N. of the cape is Round island, 200 feet high, lying off the outer point of a narrow rocky island running N.W. by W. 1½ miles, and connected with Kwang-lo by a reef. The north-east point of Kwang-lo is 3 miles N.W. by N. of Round island, and from it a chain of small islands and rocks extends 5 miles across to Five-rock point of the Elliot group. There is an archipelago to the northward, of which not less than twenty-five islands and rocks were seen from the summit of Kwang-lo.

W.N.W. 1½ miles from South cape is a Rugged island, its sharp summit being 150 feet high; a reef extends off it to the westward, with a pinnacle rock near its extreme end. The north-west point of Kwang-lo is the angle of a low plain, which is skirted with reefs, lying along and nearly parallel to the shore at the distance of 4 to 6 cables, the greater part of which are covered at high water. Lump island, which is 200 feet high, and has a long reef extending from it to the eastward, lies off this low

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point, to which it is connected by a sand spit a mile long. This island is 5¼ miles from the mainland on which a few low hills were seen, with high land far in shore. The west side of Kwang-lo affords anchorage in 6 fathoms.

Supplies.—Fresh water streams abound on Kwang-lo tau, but no watering place is known. Herds of cattle were seen grazing.

TIDES.—On the west side of Kwang-lo tau it is high water, full and change, at 9h. 55m.; springs rise about 12 feet, neaps 8 feet.

YENTOA BAY, is formed by the coast north-westward of Kwang-lo. It has many islets and reefs in it; and at its head, at the back of a high promontory, is the mouth of a river or the opening to a lagoon, named Wu-hu-mun.

Anchorage may be found on the west side of Kwang-lo tau in 6 fathoms; or in Yen-toa bay at 5 miles to the north-westward in 5 to 9 fathoms, but this bay not being surveyed, great caution should be used in standing into it, seeing the character of its shores, and that there are indications of uneven rocky ground, where sounded over.

TERMINAL HEAD (? Ma-ya shan of the Chinese chart) is the eastern point of the hilly country, stretching 20 miles north-eastward of Ta-lien-whan. It is a bluff 600 feet high, with cliffs extending along its southern face of half a mile, off which there is usually a tide race. It is connected with the main by a narrow sandy isthmus, which separates it from the eastern of three ranges of lofty hills, the western of which is a conspicuous peak, 1,000 feet high, rising from a plain. At the foot of these hills, for about 6 miles W.S.W. from the head, is a low, indented, rocky shore fringed with reefs and islets.

The coast north of Terminal head runs W.N.W. and at the distance of 3 miles is the Wu-hu mun entrance, between a low conical head at the foot of a long spur of the hills and a low sandy point half a mile to the eastward. At 14 miles to the north-west is Kwan-tung peak, a high hunch-shaped mountain, 1,580 feet high, which is a conspicuous object in clear weather.

At one mile N.E. by E. of Terminal head is Triple island with three hills on it, about 200 feet high. A sand spit extends off the west hill, with a reef at its extreme end, at a cable from the shore.

Anchorage.—The *Dove* anchored N.E. of Terminal head in 4 fathoms. There is good protection about here in all but south-east winds.

REEF POINT (? Hi-tau), 7 miles S.W. of Terminal head, is the south-eastern point of a rocky peninsula, the greatest elevation of which is 150 feet. A reef dries 5 feet at half a mile south of the point which

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should not be passed within a mile, nor the reef within 6 cables. East, 4 cables from the point, is Rock islet, 40 feet high, and N.N.E. 4 to 6 cables of the islet is a chain of rocks, just covered at high water. The bay northward of reef point is very shallow at its head, and open to the south-east, from which direction there is usually a swell in summer time, even in fine weather.

PEAKED REEF, lying 2½ miles S.W. of Reef point, has several small pointed rocks on it of a yellowish colour, of which the largest is 15 feet high. The rocks extend 2 cables. There were seen patches of discoloured water one mile N.E. by E. ½ E. and 6 cables S.W. of it, but it is possible they were only caused by the current.

To avoid the two patches of discoloured water, these rocks should be passed outside on a S.W. course, at half a mile in 14 to 16 fathoms, soft mud, or on the north side on an East course at the same distance, in 16 to 10 fathoms.

STREAM BAY.—There is a conspicuous peak, 900 feet high, on a range rising 5 or 6 miles westward of Reef point, with a high hill fronting it to the south-east. The range runs down to a bold wooded point, between which and reef point, is Stream bay, both shores of which, under the hills, are rather low and exceedingly rocky. The head of the bay is a sandy beach, on the border of a plain, off the centre of which is a square rocky islet. A stream of fresh water flows through the western end of the beach against the cliffs, but the entrance is sometimes closed, and there are several rocks off it.

KERR BAY.—The two deep inlets, immediately eastward of Ta-lien-whan bay are very shallow at their heads, open to the south-east, and therefore exposed to the summer ground swell from that direction. Kerr bay, the westernmost and larger of the two, has good sheltered anchorage in 3 to 5 fathoms. Its entrance is 4 miles N.W. by W. of Dangerous reef.

DANGEROUS REEF lies N.E. ¾ E. 9¾ miles from the south point of the Sanshan islands at the entrance of Ta-lien-whan bay, S. by E. ½ E. of "900 feet" peak, and 4 miles off shore. It is a quarter of a mile in extent, and at high tide is nearly level with the water's edge, the western and largest rock being 11 feet above low water. The soundings are 5 to 7 fathoms on its northern side, deepening rather quickly to 11 and 12 fathoms, which depth is carried to the shore. The *Pylades* passed 2½ miles southward of the reef, and had soundings of 35 fathoms; the *Blonde* at 1¼ miles, with 20 fathoms.

ROUND ISLAND, in lat. 38° 40′ N., long. 122° 11′ E., is small, round topped, 200 feet high, and is generally sighted when bound to

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Ta-lien-whan bay from the southward. The soundings at half a mile from it are 25 fathoms, mud and shells.

ENCOUNTER ROCK, discovered May 1860 by H.M.S. *Slaney* in lat. 38° 33′ 50″ N., long. 121° 40′ E., is about 70 yards in length east and west, has 24 and 26 fathoms close to, and seen from the north or south appears like a patch of small rocks, though in reality but two. From the eastern or largest rock, which is 11 feet above high water, the Cap bears N. ½ W.; the summit of Sanshan tau N.N.E. ¾ E.; Prominent peak N. by W. ¾ W.; Sampson peak N. by E. ½ E.; Liau-ti-shan summit N.W. by W. ½ W.; and Round island E. by N. 25 miles. For tides at this rock *see* p. 598.

The soundings about the rock are from 26 to 29 fathoms mud and clay; but north of it the tide has scoured out a gully 31 to 38 fathoms in depth. Tide ripples are seen West and N.E. of the rock, the latter caused by a patch of 21 fathoms water, the former by a ledge of 23 to 24 fathoms lying in that direction for half a mile. The rock is so steep that the largest vessel might lie alongside any part of it. At night, at high water it would be very difficult to see.

CAP ISLAND, or Tau-za, lies in the approach to Ta-lien-whan bay from the south-westward, 8 miles from the entrance, 4¼ miles from the coast, and E. ¾ N., 20 miles from the south-east part of Lau-ti-shan promontory. It is about 400 feet high, with its slope to the east; the western side is a cliff, vertical from the very summit. On a West or S.W. bearing it appears round, and much like the Cap in Sunda strait, but in other directions it resembles a gunner's quoin; it is steep-to, and has an islet 2 cables off its south-east side.

TA-LIEN-WHAN BAY.*—This noble bay is an extensive inlet, square in form, being 6 miles wide and 6 deep, with three smaller inlets, named Victoria, Junk, and Hand bays, branching from its head. The holding ground is excellent,† the eastern side of the bay affording the best sheltered anchorage in summer. Its principal approach is 5 miles wide, between the West Entry point and the two Sanshan islands. There is also a passage one mile wide between these islands; and another 2 miles wide between the northern island and the eastern point of entrance. Both of these channels, and the main entrance, appear to be clear of danger; but in passing between the two islands, it would be prudent to steer a mid-channel W.N.W. course through, so as to clear the 6-fathoms' mud-banks, one lying

* *See* Admiralty Plan of Ta-lien-whan bay, No. 2,827; scale *m* = 1 inch.

† The bottom in Victoria Bay is soft mud and the anchors do not readily hold, ships therefore should not anchor with less than 40 fathoms of cable, as they are liable to drag when heavy squalls occur.—Remark Book of Commander Ed. Lacy, R.N., H.M.S. *Adventure*.

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S.E. by S. 8 cables from the north island, and the other East 8 cables from the north hill of the south island, which have not been well examined, and on which there may be less water.

Victoria bay, (so named by Captain Bourchier, H.M.S. *Blonde*, in 1840) affords good anchorage in 5½ to 3 fathoms, mud. In 1860 the chief portion of the British fleet* and transports anchored in two lines along its south shore; the remainder over on the eastern shore, off Odin cove, which is a snug little anchorage with room for four or five ships if they moor.

This bay is sheltered from all winds, excepting those from E.N.E. to E.S.E. An easterly gale would have a clear fetch of 10 miles, but it is not quite evident that one has ever occurred in the spring and summer months. The inhabitants on the north side of the bay stated that these gales were prevalent, and sent in a heavy sea, while on the south side it was said that they were not known; and the shores certainly showed no evidence of ever having been visited by one. The same people who stated that easterly gales were so prevalent, also added that the bay was full of sunken rocks, but none as yet have been discovered that are not visible at low water. It is more probable that in spring and summer the prevailing winds are south-westerly, southerly and south-easterly, occasionally easterly, and certainly if the wind from the latter quarter blows with any force a heavy swell must necessarily set in.

Hand bay, formed on the east side of a peninsula jutting out at the head of Ta-lien-whan bay, affords excellent anchorage, quite land-locked for small vessels of 10 feet draught, and within signal distance of Victoria bay. North, distant one mile from the east point of the above peninsula, is the extreme of a reef, 9 cables long, and dry, or nearly so, at low water, which extends to the westward from the west side of the bay.

Odin Cove,† lying directly north of Probyn head, is about a mile broad at the entrance and three-quarters of a mile deep. The soundings shoal gradually towards the shore; the depth at the entrance is 6¼ fathoms. The north side of the cove is rocky and foul, and should be avoided; the other parts are free from danger, and there is shelter with good holding ground for a number of vessels if carefully moored. The joss-house on East cliff bearing E. ¼ S. leads about 2 cables to the southward of the reef off Breaker point and clear of all dangers on the northern shore. Between the reef off Breaker point and the shore there is a boat passage; the reef is covered at high water.

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* *See* remarks on this bay in page 575, as compared with Chifu harbour.

† Remarks on Odin cove by Navigating Lieutenant H. D. Shortt, H.M.S. *Immortalité*, 1876.

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Small vessels may approach the watering place, situated on the north shore, and anchor in any convenient depth by keeping the San-shan islands completely shut in by Probyn head; this mark leads to the eastward of all the rocky patches extending off the North Middle; vessels drawing 10 to 12 feet may anchor off the village. H.M.S. *Thistle* anchored in 15 feet at low water midway between Observatory rock (known by a small white joss-house on it) and the extreme of the reef off East cliff. Inshore of that position the bottom is sand and the holding ground not good.

The best landing place is on the south side of the cove, close to Observatory rock. At low water the boat should be beached, but at high water she may, with care, be taken alongside the rocks on the east side of the bluff. Opposite the centre of the village landing may also be effected, but at high water only. On the beach opposite the watering place, there is landing at any time of tide; except when a south-westerly swell sets in.

Coal.—(*See foot* note.*)

Good water may be obtained at the stream on the north side of the bay. For pumping into a boat a long length of hose is required, except after rains, when the stream is much swollen.

It is high water full and change in Odin cove at 10h. 40 m.; springs rise 11 feet, neaps 7 feet. The flood tide sets round the cove from north to south; the ebb sets in the opposite direction.

During the month of August the A.M. tides were always the highest; this difference at springs amounted to 3 feet. The A.M. tides were also lower than the night tides, but the difference amounted to only a few inches.

The inhabitants are civil and willing to trade; sheep, poultry, and eggs are plentiful, also fish; but the oysters should be avoided, as they are found to produce diarrhœa. The produce of the country is millet and Indian corn. Game is not abundant, but pigeons are numerous on the south side of the cove and round Probyn head.†

Supplies.—The flat country at the foot of the hills surrounding Talien-whan, appears to be good arable land well cultivated. Large quantities

* According to a proclamation published in the Shênpoa newspaper at Shanghai The Chinese Government are about to open and work with foreign machinery some coal and iron mines which have been discovered at Loma (Camel-horse) hill, in the southern Chin-chow district in Talienwan bay. The proclamation states that the coals and iron are found in the same hill, and only 2 miles from the shore The result of analysis, gave 88 per cent. of carbon in the specimens of coal examined, and the iron-ore 90 per cent. of loadstone, and from 45 to 51 per cent. of superior iron without shingle.—Consular report for 1882, by Herbert J. Allen, British Consul, at the port of Newchwang.

† *See* Admiralty charts:—Gulf of Pe-chili and Liau-tung, and northern portion of Yellow sea, No. 1,256; Ta-lien-whan bay, with plan of Odin cove; scales, m = 1 inch and 5·3 inches.

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of a kind of dwarf Indian corn, millet, and wheat (kaouliang) are grown on it. Vegetables are scarce, and from the latter grain above mentioned a spirit is distilled.

The hills afford grazing for sheep and cattle, and hay is preserved for winter consumption. In exchange for their grain and sheep, the natives bring cloth, tea, sugar, &c., from Shantung. About the end of February, a fleet of junks cross over to the Korean coast to catch salmon. Fish, in general, appear to be scarce in the bay, but shell fish, oysters, and large mussels, are very plentiful, and from the quantity of shells observed around the dwellings of these people, appear to form a considerable portion of their animal food.

Wood is very scarce, the country being entirely destitute of timber. Water can be obtained with much labour, by digging wells. At Odin cove, however, it is more readily procurable. Here an unfailing water course was dammed by the squadron in 1860, and a basin carefully lined with stiff clay, and by this means 100 tons of water were daily collected and sent off to the transports. About 10 tons a day were procured in the same way from a little cove half a mile to the north, and 25 tons* at a beach at the foot of a valley a mile farther north. On the west side of the bay no water was to be had except after rain.

TIDES.—It is high water, full and change, in Ta-lien-whan bay at 10h. 47m.; springs rise 10¾ feet, neaps about 8 feet.

At the Encounter rock (p. 595) it is high water at 10h. 44m.; springs rise about 11 feet, neaps 8 feet. The tidal streams off this rock are somewhat rotatory. As observed at full and change, in H.M.S. *Dove*, they are as follows:—During the first 3 hours of flood, preceding the moon's transit, the stream set weakly to the eastward, it then turned and set W.N.W. three-quarters of a knot per hour. The whole ebb set W.N.W. 1 to 1½ knots. During the succeeding flood, it set the 1st and 2nd hour, N.N.E. three-quarters of a knot, the 3rd, 4th, and 5th hours E.N.E. 1½ knots; it then slackened, and during the 6th hours set W.N.W.; the ebb for the 1st and 2nd hours ran W.N.W. weakly; the remaining 4 hours it set East, weakly, continuing during part of the flood as above mentioned.

At 3 miles north of Dangerous rock, observations were also made, and considering that this position was only one mile off shore, and affected by the contour of the coast, it will be seen that there is considerable identity between the two sets of observations. The whole of the ebb set W. by N.; its rate for the first four hours was a quarter of a knot, and the last 2 hours half a knot. The 1st hour flood ran W.N.W. half a knot; the 2nd hour,

* Commander E. Lacy, R.N., remarks that at either place an engine and good length of hose are required.

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slack; the 3rd to 4½ hours, E.N.E. to N.N.E. half a knot; the remainder of flood W.S.W. a quarter of a knot. The first 3 hours of the succeeding ebb, also W.S.W. a quarter of a knot; 4th and 5th hours, N.N.W.; 6th hour, N. by E.

DIRECTIONS.—To a vessel making the land in clear weather, mount Sampson, a solitary mountain, 2,210 feet high, would be visible, and when it is brought to bear N. by E., the main entrance to the bay is open. The San-shan islands are 500 feet high, and may be approached to half a mile. They lie nearly North and South of each other, and when seen east or west of the former bearing, appear to consist of three, in consequence of the southern island being divided into two hilly portions, connected by a low isthmus of small boulders and shingle about 10 feet above high water.

In foggy weather, so common in the spring and early summer, there is danger of mistaking other peaks, which shew out from time to time above the fog, for mount Sampson; under such circumstances it cannot be considered prudent to stand in to the bay unless the land can be properly identified, or Round island, or San-shan tau, be previously made. Prominent peak, 11½ miles westward of West Entry point, has been frequently noticed to be the first to show out in foggy or hazy weather.

In strong winds from N.W. to S.W., heavy squalls come off the hills about West Entry point, requiring sometimes the topsails to be lowered.

The COAST from West Entry point of Ta-lien-whan bay trends about S.S.W. 2¾ miles to South Entry point, which is shelving and has off it a low islet surrounded by uneven reefs together extending S.W. a quarter of a mile from the point. The islet does not show very plainly unless rather near it. About the middle of this coast is a small sandy bay, off which is Pang tau, a wedge shaped island, sloping to the eastward and bold to. Breakers have been observed inside the island.

CAMBRIAN COVE, outside Ta-lien-whan to the south-west, would appear to be a good temporary anchorage, especially in northerly winds. Its entrance is three-quarters of a mile wide, between South Entry point on the east, and two sharp, prominent, rugged hills on the point to the west. The navigable part is 8 cables deep, the soundings decreasing from 17 fathoms close to the reefs on the east side of entrance, to 4 fathoms at a quarter of a mile from the eastern bight at the head of the bay, where there are some reefs, with 3 fathoms inside them. There are two other bights at the head of the cove to the north-westward separated from each other by a low tongue of land, but both are dry at low water.

TA-LIEN-WHAN to PORT ARTHUR.—A smooth topped island lies N.N.E. 2¾ miles of the Cap (*see* p. 595), its eastern or

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highest part being a round hill about 100 feet high; low cliffs surround it and there is a reef off its north-west part; a small pinnacle islet also lies half a mile East of it. Otherwise the island appears steep-to, there being 18 to 19 fathoms, mud, at 3 to 5 cables round it.—N.N.E. and N.E. by N. of this island are two other islands, about the same height, at half a mile from the shore. There are 13 and 14 fathoms, mud and shells, in the channel between these and the smooth-topped island, but in mid-channel, one cast was obtained of 5 fathoms, coral. A reef, which scarcely uncovers, also lies half a mile, N.E. by E. of the eastern of the two islands.

The 2¾ miles of coast, running west from Cambrian cove and facing these islands, has a shore of steep hills and cliffs, with 16 to 17 fathoms a cable or two off it. There is a deep valley just north of the islands, from which the coast, with rocks 3 or 4 cables off it, bends north-westward 2 miles, terminating in the high perpendicular Bithoff cliff, a conspicuous object at many miles off shore. A small stream through a plain faced by a sandy beach, falls into the sea close to the west side of this cliff.

Thence the coast bends round to the south-west 6 miles to a rocky peninsula, Siau-ping tau or Bluff Bevan, forming a bay, the approaches to which have not been sounded, but there are 6 to 7 fathoms not far off shore. This part of the coast has a broken rocky shore of small bays, points, and reefs, (the latter extending 2 to 3 cables,) under a line of low hills, but at the back is an amphitheatre of high hills, in the centre of which, and N.W. 8 miles from the Cap, rises Prominent peak, about 1,000 feet in height. This peak was noticed from the Encounter rock to be the first to show out in hazy weather, and continued visible for several hours, when all the other land was obscured. The whole range is nearly as high, its north-eastern part ending in a peak of 890 feet, to the south-east of which is a triple-topped hill, 600 feet high, on the plain and directly over the beach, west of the remarkable Bithoff cliff. The south part of the range is a high table, the slopes of which break into the sea.

Bluff Bevan, a low, narrow, rocky peninsula, bordered by a cliff, is above a mile in length, lying parallel to a low flat shore, to which its central part is connected by a low isthmus, with a village on it. A group of five islands lies from half to 1½ miles off its eastern point. The channel between these and the peninsula is deep. There are bays on both sides the isthmus with low and sandy shores; that on the north-east side is called Tung-kau, the other Si-kau.

This peninsula may be passed at 2 to 3 cables in 20 to 28 fathoms, mud. Anchorage can be obtained in Tung-kau bay in 3 to 8 fathoms with some shelter from the islands, there being a clear passage east and north, as well as that above mentioned west of them. There is a reef in the northern

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part of this bay, contracting the inner anchorage to a space of 6 cables. There is also a reef 3 cables from the northern shore of Si-kau bay, east of which, and close to the isthmus, a small vessel may obtain anchorage, well sheltered except from south-west, in 4 fathoms.

In 1840 the *Blonde* and *Pylades* anchored outside Si-kau bay, and were well sheltered from north-westerly and easterly winds, but exposed to the southward and south-westward. From their anchorage in 16 fathoms, the west point of the peninsula bore E. by S. ¾ S., centre of the village N.E. by E.; the bottom was irregular, but the holding ground good. Good water was procured in small quantities, N.W. by N. from the anchorage. Wood appeared to be scarce; cattle were numerous.

From Bluff Bevan a steep shore trends West 3½ miles, when three valleys occur; from thence it continues its westerly direction 4½ miles, then bends 2 miles south-west to Swainson point, off which, at 3 cables, are 18 fathoms on the steep edge of a small reef. Between the Bluff and the three valleys there are 17 fathoms at half a mile off shore; they then gradually shoal to 6 fathoms in the bight 4½ miles to the westward.

PORT ARTHUR,*†‡ West 2½ miles from Swainson point, is a large inlet having a narrow entrance. Its eastern head is 400 feet high; and off some cliffs between it and Swainson point a reef extends at least half a mile, with 19 fathoms at a mile, to avoid which, as it is not clearly defined, it would not be prudent to enter the port on a course other than between N.W. by N. and North, the latter course avoiding rocks off the western shore.

When approaching from seaward the entrance to this port is easily recognized by a hill 600 feet high, situated at the head of the harbour, eastward of which another hill, 400 feet high, rises over the east entrance point; both of these hills have well-defined summits.

A village with joss houses is situated on the north side of a shallow bay on the east side of the harbour.

Entrance.—The entrance is 270 yards wide between steep cliffs, close to which there is deep water.

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* *See* plan of Port Arthur on Admiralty chart, No. 1,892.

† Lieutenant H. C. Martin, H.M.S. *Albatross*, 1880.

‡ On the eastern side of the harbour of Port Arthur, works of excavation are in progress for the construction of a large steam basin. A graving dock capable of taking large ships is also contemplated. The fort (on the 400 feet hill) at the eastern entrance is armed with two 17¾ ton, and five 29 cwt. Krupp guns; the heavy guns facing seaward. It is intended to build other forts, so as to completely command the entrance.—Derived from report of Commander Hotham, H.M.S. *Kestrel*, 1883.

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From the north side of the west entrance point a long spit extends in a N.N.E. direction, having a mound on its northern extreme, from which a shoal, steep-to on the eastern side, extends E.N.E. for a distance of 120 yards. On the eastern side close within the entrance, there is a small mound surmounted by a battery and watch house.

Bar.—The bar, which is composed of stones and mud, is situated at some distance within the entrance, and has over the shallowest part a depth of 14 feet at low-water springs. In October 1883, the passage over the bar had been partly dredged, to a width of 50 yards; and a depth of 25 feet at low water springs.

Leading mark.—A knoll on the hill 600 feet high (situated over the head of the harbour) in line with a small house on Observation point bearing North, leads across the bar in a depth of not less than 15 feet.

Caution.—An old fort is situated close east of the house used as a leading mark; care should be taken to avoid mistaking it for the house.

Anchorage.—The best anchorage is between the extremity of the western spit and Observation point, where the holding ground is very good, being of soft mud, and only a small scope of cable is necessary. From 8 to 9 fathoms water will be found inside the bar.

The *Albatross* (164 feet long) anchored with house on Observation point, bearing N. 36° E.; Flagstaff, E. 14° N.; Knob on mound on east side of entrance, S. 44° E. From this position, with 18 fathoms of cable out, the *Albatross* found just sufficient swinging room. There is space between the extreme of the western spit and the bar to admit of two small vessels being moored.

Tides.—Spring tides rise 8 feet in port Arthur.*

LIAU-TI-SHAN PROMONTORY.—From Port Arthur the coast trends S.W. by S. 5 miles, and then turns W. ½ N. 3 miles along

* Stone beacons have recently been built on the end of Fisherman's, and Stoney Spit; there is stated to be 50 feet depth at a distance of 5 yards from the former, and 20 feet close outside the latter of these marks..

An embankment is in progress to connect the end of Stone Spit with Watch Tower point; and on the ground thus reclaimed it is intended to build a dockyard.

When laying inside the stone beacon the anchorage is completely protected from wind and sea.—From Remark Book of Lieut. G. Pollard, H.M.S. *Zephyr*, 1882.

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the southern face of the Liau-ti-shan promontory, and again the same distance to the N.N.W. Liau-ti-shan is the mountain, 1,500 feet high, rising at the south-western extremity of the peninsula of Kwang-tung, named by Sir Murray Maxwell in 1816 the Regent's sword, and which, being separated from the hills to northward by a plain, makes from a long distance like an island. The mountain slopes gently and evenly from its summit, though broken by ravines and edged by cliffs at its base, the southern face forming a high bold promontory, which may be passed at 2 cables in 20 fathoms.

With the south head of the promontory bearing E.S.E. 15 miles the *Pylades* anchored in 15 fathoms, mud, the ebb tide setting strong to the S.E. From this towards the head, the water deepened to 20, 25, and 30 fathoms, and when the head bore N.W. by W. 6 miles, discoloured water was seen bearing North, having the appearance of a long dangerous spit running out from the land to the southward ; three boats were sent to examine it, but after sounding every part, had nothing less than 30 fathoms, from 3 to 5 miles off shore—the change in the colour of the water being occasioned, it is supposed, by the muddy bottom or the meeting of the tides. This coast was well surveyed in 1860.

INTERIOR of SHANTUNG.—Information concerning the chief towns and cities of the coast, and of the interior of the province of Shantung, also its rivers, productions, trade, &c., not contained in this work, will be found in "Notes of a Journey through Shantung," by J. Markham, Esq., H.M. Consul at Chifu, published (with map) in the Journal of the Royal Geographical Society for 1870, page 207. An exploration of the old bed of the Yellow river, by Ney Elias, Esq., is contained in the same volume, page 21.

INTERIOR of LIAU-TUNG.—Explorations of the interior of the province of Liau-tung or Shing-king have been made by the Rev. Alexander Williams, B.A., in 1868, and by the Archimandrite Palladius of the Russo-Greek church at Peking in 1870 ; both accounts will be found in the Journals of the Royal Geographical Society, the former in Volume XXXIX. for 1869, page 1, the latter in Volume XLII. for 1870, page 142.

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CHAPTER X.

GULFS OF PE-CHILI AND LIAU-TUNG.

INCLUDING THE PEI HO, THE YELLOW, AND LIAU RIVERS, AND THE TREATY PORTS OF TIENTSIN AND NEWCHWANG.

VARIATION 2° 30′ WEST to 4° 0′ WEST IN 1884.

GENERAL DESCRIPTION.

The head of the Yellow sea branches out into a double headed gulf, one head extending to the west 150 miles, the other about the same distance to the north-east, forming a great inland sea, known to the Chinese as the Peh-hai or North sea. The southern part of this sea has received from foreigners the name of the gulf of Pe-chili, and the north-eastern part that of the gulf of Liau-tung. At its entrance the coasts approach within 55 miles of each other, and the space between is called Pe-chili strait, the southern part of which is occupied by the Miau-tau group.

The shores of the gulf of Liau-tung were almost a *terra incognita* to Europeans until the year 1793, when H.M. Ships *Discovery* and *Alceste* navigated its southern portion and anchored in Hulu-shan bay. In August 1855, H.M.S. *Bittern* sailed along the eastern coast and anchored in Fu-chu bay and off the port of Newchwang. Subsequently, in July 1859, a survey was made by Commander J. Bythesea, H.M.S. *Cruizer*, and Major A. Fisher, Royal Engineers, of part of the western coast from the Great Wall of China to the Chi ho, 25 miles south of the Pei ho. The remaining shores were surveyed in the fall of the year 1860 by Commander J. Ward, Lieut. C. Bullock, R.N., and officers of H.M.S. *Actæon*, *Dove*, and *Cruizer*.

The gulf of Pe-chili borders the north-eastern margin of the Great plain along the shores of the provinces of Shantung and Chili, receiving several rivers, chief amongst which is the Yellow river. At its head is the entrance of the Pei ho, on which river stands Peking, the capital of the empire, and also the opulent city and treaty port of Teintsin. The gulf of Liau-tung is the continuation of a great valley of Manchuria, lying between two mountain chains in the province of Shing-king or Liau-tung, which encompasses its sides. The Liau ho falls into the head of this gulf, on which river, at its entrance, stands Yingtze, the treaty port of Newchwang.

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CLIMATE.—From remark books of H.M. ships it appears that the climate of this region is temperate and agreeable in summer, and severe and stormy in winter, but the latter is of only four months' duration. The coasts are then covered with snow, which begins to melt in March, snow storms occurring as late as the end of February, and showers until the middle of March, when the winter season breaks up. At the head of the gulf of Liau-tung the ice lasts 4½ months, from the middle of November to the end of March.

A dry season then commences, with scarcely any rain during the summer months; light winds, exceedingly variable and of short duration in any quarter, prevailing. About the autumnal equinox there are symptoms of unsettled weather, and westerly winds prevail, with occasional short gales.*

In October the temperature of the water falls 20°, sharp frosts frequently occur at night; at the end of that month snow falls in the northern part of the gulf of Liau-tung, and a month later at the entrance of the Pei ho, accompanying north and easterly gales, which also bring severe frosts. Thin layers of ice are now rapidly formed at low tide on the extensive mud-flats, and are carried by the flood into the rivers, which become frozen up permanently about the middle of December. The ice becomes compact for 20 miles from the shore off the Pei ho, filling up the entire head of the gulf to a line S.S.W. of the Sha-lui-tien banks (*see* p. 641). The river opens in March.

The climate† in the gulf of Pe-chili appears generally very good. The weather, from the 11th of July to the 8th of September, was exceedingly fine, and the wind moderate, the thermometer ranging from 72° to 80°, and the barometer steady at about 29·50 inches. Although the rainy season is said to be during the months of July and August the rain was distributed over the earlier summer months, and very little fell in August and September. The winter begins at the commencement of November, and ends early in April, during part of which period the rivers are frozen, and the sea to a distance of 20 miles from the shore. Snow falls from 2 inches to 2 feet deep, the latter being considered severe.

WINDS and WEATHER.—H.M.S. *Ringdove* was employed during the months of January, February, March, and April in running the mails between the Pei ho, Hope Sound, Chifu, and Shanghai, in 1861, and Mr. James S. Watts, Master R.N., gives the following account of the weather for that period. "The winds during January, in the Yellow sea and gulf of Pe-chili, were in general from the North. The gales, four of

* Description of the weather in the year 1860.

† Commander J. Bythesea, R.N., 1858.

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which we had in that month, lasted 4 and 5 days each, commencing from N.E. veering to N.W., and dying away at North; they were accompanied by snow, and were searching and bitterly cold. In February the wind had more easting, but was about the same in strength, and gales equally frequent. In March the wind was light and variable, 14 days from West and N.W., and the remainder of the time from the eastward. In April it was also light and variable, 14 days it had southing in it generally South to S.E., and the remainder of the month it was from North to N.W. In the gulf of Pe-chili the westerly winds were laden with dust, which was very unpleasant, covering the deck and rigging, and which the night dew converted into mud; it was also very irritating to nostrils and eyes, and at times obscured the land at the distance of 4 miles."

"In Hope sound, in January, the gales were accompanied by snow, but at other times the air was dry, whilst in the Yellow sea and Shanghai it was wet and gloomy. In February it was also cold, the temperature ranging from 20° to 41°, but in the Yellow sea and at Shanghai it was damp, cold, and foggy, though less wet than in January. In the gulf of Pe-chili, in March and April, the weather was very fine and the air dry and bracing."

To the above the following fragmentary* observations may be here added, with the remark that fuller information regarding the weather and climate of the principal localities is afforded in their respective places in the succeeding pages.

In the latter part of February, in Ta-lien-whan bay, the wind was North 9 days; N.W. 1 day; N.E. 3 days; Calms and variable 2 days. There were high winds and snow on 2 days; fog on 4 days.

March.—On the south coast of the gulf of Pe-chili the wind was N.W., 5 days; North 12 days; N.E. 3 days; East, 5 days; S. and S.E. 2 days; S.W. 2 days; calm and variable, 2 days. The southerly winds occurred only at the end of the month. The winds were chiefly light, and unsteady except at North. Strong breezes commenced at N.E. and moderated as they veered to N.W. Snow fell on 6 days, rain 2 days; and there was fog on 4 days.

April, May, June, July.—From the 14th April to the 10th July 1858, the period H.M.S. *Pique* remained at the anchorage off the Pei ho, the weather was fine, but sudden changes of wind were frequent, and as a breeze from seaward brought in a heavy sea, much caution was necessary to avoid accidents to loaded boats. From 14th April to 7th May the changes of wind were constant, and rarely was it smooth enough for boat

* It is much to be desired that some navigator of experience would supply an epitomized account of the winds and weather of this region and of the Yellow Sea.

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work throughout the whole day. Later the sea was much smoother, and boat operations were not often interrupted. On the 7th June a very heavy squall came on from the northward, and it blew hard from that quarter until next day.

East and South winds prevailed off the Pei ho in July 1860. Occasionally heavy sudden squalls, dangerous to boats, from N.E., occurred, accompanied by large hailstones.

For the first half of April on the south coast of the gulf, the wind was N.W. 2½ days; North 3 days; N.E. 1 day; East half a day; S.E. half a day; S.W. 1½ days; calm and variable, 1½ days. There was no rain, nor fog; one strong wind of short duration from N.W.

At Ta-lien-whan bay in June, there were calms on 16 days; light winds on 22 days; rain on 6 days; thunder and lightning on 3 days; fog with East and S.E. winds 7 days. A moderate gale from S.W. occurred for a few hours. In July, it was calm part of 10 days; light winds 17 days; fog, 4 days; showers on 3 days. There were no strong winds, and they were seldom steady even for 4 hours, except between East and South or at S.W. The weather was beautiful and cool, rather hot at mid-day, and with S.E. winds prevailing.

August.—Off the Pei ho in 1860 the wind was generally light, with occasional squalls; never steady at any point but S.E., and not often then. One fresh breeze from S.W. Rain on 3 days; thunder and lightning 1 day.

September.—Off the Pei ho the wind was eastward of North and South but less so than in August. In the gulf of Liau-tung there were calms on 17 days; light winds on 21 days. Smart breezes on 7 days from North to South, but seldom steady for a day. Rain on 3 days.

Towards the end of September and the early part of October the weather is sometimes very changeable, with strong winds from N.W., which lower the water in the gulf 1½ feet.

October.—Off the Pei ho light winds prevailed west of North and South. Calm many days. In the gulf of Liau-tung there were calms on 9 days; light winds on 16 days; three gales of short duration from N.W. and W., force 7 to 8. Rain on 5 days, with N.W. and South winds. Snow for 24 hours, at head of the gulf, on the 29th October. Wind rarely steady for a day.

November.—Off the Pei ho the winds were westward of North and South, with a very small proportion of North and East; the wind rarely steady a whole day. Calms on 5 days; light winds on 11 days; fresh breezes 10 days. There were also four gales; S.W., force 7, veering to West and N.W.; N.W., force 10; N.E. force 8, veering East and S.E.; and N.W. force 9. Snow at the end of month.

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Another account states that in this month, N.E. gales, veering from E. to N.W., had set in at the Pei ho, blowing for two or three days together.

December set in with 8 days of calm mild weather, and a thaw occurring, the Pei ho, then nearly impassable, opened again for navigation until the middle of the month. On the south coast of the gulf the wind was seldom steady for a whole day. At Hope sound, a moderate gale from North to N.W. succeeded the fine weather.

TEMPERATURE.—At Ta-lien-whan bay and at Chi-fu in February, the barometer ranged from 29·78 to 30·41 ; constant and rapid changes in the mercury, falling to southerly winds and snow. Temperature of the air as low as 22° Fahr. ; of sea water (surface) 33°. The heads of the small bays filled with ice.

March.—Bar. 30·1 to 30·5. Sea water 32° to 35°. Air 27° to 60°.

April.—Bar. 29·7 to 30·5. Falling to southerly winds, rain, or fog. Sea water 37° to 46°, gradual increase. Air 39° to 73°.

May.—Bar. 29·8 to 30·5. Sea water 46° to 56°.

June.—Bar. 30·0; ther. 75°. Sea water 56°, increasing to 68°.

July.—Bar. 30·3 ; ther. 78°. Sea water 68° to 82°.

August.—Bar. 30·2 ; ther. 75°. Sea water 84° to 78°.

September.—Bar. 30·7 ; ther. 104° to 65° in 24 hours. Sea water 78° to 68°.

October.—Bar. 30·5 ; ther. 76° to 32° at the end of the month. Sea water 68° to 48°.

November.—Bar. 30·4 ; ther. 40° to 13°, generally at 30°. Sea water 48° to 36°.

December.—Sea water 40° at the Pei ho, 44° at Hope sound, 50° at Shantung promontory, and 53° to 56° in the Yellow Sea.

DURATION of ICE in WINTER.—The Pei ho becomes frozen up finally, after one or two previous warnings, about the middle of December. Early in January the sea, in its locality, is frozen out about 5 miles, and by the end of the month the ice-field has extended 20 to 30 miles off shore, where it is 2 to 3 feet thick, whilst floating ice is met with 75 miles from the river's mouth. At Sha-lui-tien island the strength of the tidal streams do not allow the ice to set fast. The western bight of the gulf of Pe-chili has also an ice-bound coast, although not to the same extent. *See* also page 633.

The Liau ho is frozen up for nearly 4½ months, or from the middle of November to the end of March.

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At Tientsin, during the winter of 1860–61*, the highest temperature during the day was from 25° to 28°; the lowest at night 4° to 6°, except during the severest period from the 8th to the 14th of February, when it fell to 6° degrees below zero. From this time the weather grew gradually warmer, and on the 20th of March it was 65° in the shade.

On the 11th of March the ice parted with a great rush, and owing to a continuous ebb tide for 48 hours, had nearly all disappeared on the 13th. During its breaking up the ice was impotent to hurt a vessel riding at anchor in the stream. This winter was considered by the Chinese to be unusually severe, and the season a late one.

The prevailing winds up the river during the winter were N.W. and S.W., the former being very strong and raising the fine dust to a great height, when it is sometimes so thick as to obscure the sun.

The barometer gave no warning whatever; sometimes rising to a northerly, and sometimes to an easterly gale with snow, and on the contrary, sometimes falling to both. There was no rain and very little snow.

GALES.—Storms are rare in these gulfs.† There are sometimes gales during the summer, but they are more of the character of very strong breezes, and rarely last 12 hours, during which time they veer considerably. Those from S.W. are steady; those from N.W. usually commence with a light easterly wind. On the approach of winter, October and November, they are more frequent, often continuing two or three days, with a force of 8 to 10. There are also veering gales, usually commencing at E.N.E. blowing strongest from the N.W. quarter, and moderating at W.N.W. The steady north-westers do not seem to blow beyond the Shantung promontory.‡

Squalls, sometimes very sudden, and thunderstorms are not unfrequent in summer, and are often accompanied by hail. In April 1860, a whirlwind was seen, which carried up the sand of a valley in a column several hundred feet in height. Both squalls and gales, and sometimes rain and fog, are preceded by a rapid fall of the barometer. Commander Goodenough of H.M.S. *Renard* states that an easterly breeze accompanied by a fall of the barometer was sure to be succeeded by a severe gale from North, veering to N.W. followed by a rapid rise. There was one instance in which the gale followed the rise of the barometer after fall.

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* H. V. Russell, Act. Sec. Master of H.M.S. *Slaney*.

† *See* note at page 677 on gale at Newchwang.

‡ A gale from N.E., force 8, lasting only 4 hours, is recorded at Chi-fu on August 25th; also a gale off Wei-hai-wei on April 5th, from N.N.W., force 9, commencing at East with 3 or 4 hours rain and veering by North to N.N.W.

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SUPPLIES.—Cattle, sheep, vegetables, and breadstuffs may be obtained without much difficulty at all places of resort in the gulfs of Pe-chili and Liau-tung, but at the ports, or where there are markets, they are abundant and cheap, as are also game and fruit. Water is not generally obtained with ease, but where junks frequent, regular watering boats supply the shipping, the water, which is excellent, being carried in large tubs. The water of the rivers is said to be wholesome, and may easily be cleared by alum. Lime and alum can be purchased at Peh-tang and Taku. Fish is plentiful; April and May is the herring and cod season at Chi-fu and Wei-hei-wei. Wood is scarce both for fuel and building purposes, and is imported from Ta-ku-san, a place in the Korea, eastward of Ta-lien-whan, unknown to foreigners until 1868. Soft pine and fine white elm are obtained there; and this place supplies all the coasts of the gulfs with wood.

ASPECT of COAST.—From Miau-tau strait (page 578) the southern coast of the gulf of Pe-chili trends a south-westerly direction for 60 miles to Lai-chau. The coast is low, lying under a mountain range, the crests of which are from 10 to 15 miles inland. Low spurs break through the otherwise even coast-line and, projecting at some points far from the shore, constitute dangers, which should be approached with extreme caution in bad or thick weather, more particularly in northerly or north-westerly gales, when at night the reckoning may be in error on account of the current.*

East of Lai-chau the mountains turn abruptly to the south the coast bending westward round a large shallow bight, 30 miles across. Thence it continues in a north-west direction for 120 miles to within 30 miles of the Pei ho. This part of the coast, the margin of the Great Plain, is low, sandy, and almost a desert. Scantily populated, its inhabitants live in small wretched hamlets, in mud hovels built on banks elevated a few feet above the plain, and in a state of extreme poverty.

DAVENPORT POINT, a low rocky head, 6½ miles W.S.W. of Teng-chau head, has a large village on it marked by a conspicuous tree on an earthwork. At the back of the village is a low hill on which is a large artificial mound. The point is bordered by reefs covered at high water, their outer part being N.W. 6 cables from the point. Inland, S.S.E. ½ E., 3 miles from the point, is a dark bluff, 600 feet high, the most conspicuous hill seen from the westward.

The coast from Teng-chau head is a sandy strip at the foot of a range of hills, on one of which is a stone cairn. The bay, inside Teng-chau bank

* *See* Admiralty Chart of Pe-chili and Liau-tung Gulfs, No. 1,256; scale, $d = 5{\cdot}1$ inches, on which are five plans.

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(p. 577), appears to be quite clear of danger. A mile west of Davenport point is the mouth of a small stream, Lwan-kia-kau, where a few junks are generally seen at anchor. The low coast here commences.

The Yeh-shan and Keuh-shan peaks, of 2,065 and 2,515 feet elevation, are the two highest points of a mountain range to the south-west; a ridge runs to the north-west from the latter, terminating in a steep, sharp peak 1,420 feet high, 5 miles from the sea.

SANG TAU, a low island, the highest part of which is elevated 30 feet, lies 8½ miles west of Davenport point, and 1½ miles north of Hwang point, an elbow of the low sandy shore, on which is a small sand hill. The island is about one mile across, and has a village and temple on its south-eastern point, also a tree which is seen when the island has dipped. It is surrounded by ragged reefs, the points of which dry out 2 or 3 cables, with uneven ground outside them. A detached reef lies 7 cables S.E. by E. of its north-east point, between which and the reef are not more than 3 fathoms. A large reef, on which is a sandy islet, lies also half a mile N.W. of the island, with shoal water and very uneven ground extending 1 to 1¼ miles N.E. and N.W. of it. In passing outside this islet at 6 cables irregular soundings of 3½ to 8 fathoms were obtained; it should therefore be approached with great caution.

Knob hill, 120 feet high, is 3 miles E.S.E. of Hwang point, and near it is the town of Hwang-hien or Hwang-ho-ying, not visible from the sea. The passage inside Sang-tau has been only partially examined; the deepest water is 6 fathoms at one third from the shore, but west from 1 to 3 miles from Hwang point is a bank of rock, gravel and sand, and it is not known whether this is connected with Sang-tau or not, from which it lies S.W. 1½ to 2½ miles.

CHI-MA-TAU PROMONTORY, or Pau-mu-tau, 11 miles S.W. by W. ½ W. of Sang-tau, is a small range of hills at the extremity of a low isthmus of sand, 4½ miles long, stretching West from the mainland. The promontory is 350 feet high, with cliffs on its sea faces. Off its western point is a semicircular reef, the heads of which uncover, with 10 and 11 fathoms close to. Its south point is low, where there is a village at the base of the hills. The north side of the isthmus is a steep beach, but there are some straggling rocks, lying off the commencement of the cliffs.

LUN-KAO BAY.—At 4 miles E.S.E. of the south point of Chi-ma-tau on the south side of the sandy neck which forms a large bay, a small stream disembogues, and on its banks by the sea shore is the village of Lun-kao. Several junks were at anchor off the entrance, which is approached from the S.W. by W. by a narrow channel through the banks

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outside carrying 9 feet water, decreasing to 6 feet at 2 cables off the river entrance. On the north shore of the bay, the banks off the isthmus dry out from 1 to 1½ miles, and a somewhat less distance to the south of the river.

SAN-SAN SADDLE.—Three hills (or more correctly San-shan), 195 feet high, is a double-topped hill, but a sharp-topped shoulder on the east gives it the appearance of three hills. It rises at a projecting point of the sandy plain, 20½ miles S.W. ¼ S. of Chi-ma-tau, the coast between forming a large open bay. Its north point is a cliff, which tapers away to the south-west for a mile, to a rocky point and island round which is the outlet of two small streams; a village of considerable size stands here at the base of the hill.

Three miles south-westward of San-san a small, remarkable hill, 100 feet high, rises abruptly from the plain. To the southward, inland, are several isolated hills, the twin-topped hill nearest the sea (4½ miles), being a conspicuous mark. The lofty range of mount Elias is 20 miles southward of the Saddle, from the northern summit of which, elevated 2,190 feet, a long ridge runs N.N.W. 13 miles. Farther to the south is a sharp peak 2,430 feet high, 15 miles from the coast and S. ⅓ E. 25 miles from the Saddle. There are several lower ranges in front, all of which are said to be covered with an impenetrable jungle.

Two points, with small reefs off them lie 3½ and 7½ miles respectively E.N.E. of San-san; on the former is a sand hill and a shrine.

The soundings off the coast are even and gradual, bottom sandy near the shore

Rock.—There is, however, a rock with 2 fathoms on it, laid down on an old chart, equidistant between Chi-ma-tau and San-san Saddle, about 5½ miles off shore, in lat. 37° 32½′ N., long. 120° 4′ E. A 15-feet flat also runs from the shore of the small bay next east of the Saddle, its outer extreme being N.E. ¾ N. 2½ miles from the Saddle.

Supplies.—The large village at the base of the Saddle has a fishing population. Its well built houses of stone show a marked contrast to those of the miserable villages called pus* scattered along the sea coast which borders the Great Plain to the westward.

SANDY POINT.—S.W. by W. ½ W. 5¾ miles from the Saddle is a sandy point beyond the red temple Hai-miau, which latter is a conspicuous object on the summit of a small hill, 100 feet high. This point is very shelving, and dries out in spits and patches for 2 miles. There appeared to be the entrance of a small river close round the point, but at

* *Pu* means a sea shop. They are small clusters of huts on the sea shore.

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low water it is only approachable from the southward in 7 to 8 feet. Junks were seen at anchor off it. There is a small village there, north of a large sand hill, and abreast them a dry sand bank, south of the entrance and 4 cables off shore.

FUYUNG-TAU or Quoin island, bearing S.S.W. ¾ W., 3 miles from Sandy point, is 200 feet high, and in shape resembles a gunner's quoin. A small rock, that does not quite cover, lies 4 cables to the west of it. There are only 7 feet water between Quoin and the shore to the south-east. Quoin and the Saddle, and the small rocky hill south-west of the Saddle, are the only conspicuous objects on this part of the coast.

The LAI-CHAU BANK, a strip of hard sand, very shoal, and having several dry patches, extends from Sandy point 8½ miles to the north-westward. It is nearly 4 miles broad at its base, and from 1 to 1½ miles at its outer part, very steep on its western side, and also at its northern extremity, which branches into two points; at other parts it is shelving. Exceedingly dangerous from its great extent, it is rendered still more so by the tide setting directly across it. The Saddle bearing S.E. by E. leads in 7 to 8 fathoms close to the north-eastward of its north-extreme: and the high sharp peak of mount Elias open westward of Fuyung Quoin S.S.E. ¼ E. leads to the westward. The bight on the east of the bank is called Tai-ping-wan, Great Peace bay; the bottom is soft mud.

LAI-CHAU BIGHT, about 45 miles across, is the southern head of the gulf of Pe-chili. Its western part is extremely shallow, there being only one fathom water at 5 miles from the low shore, which is not visible from navigable water. To the eastward near Quoin, it is deeper, and 3½ fathoms may be obtained south-west of that island, at 4 miles from the coast. Two rivers, the Sin ho or New river, and the Tan ho or Rapid river, discharge into the western part of the bight; their position is not accurately known, nor are they approachable except by the smallest craft at high water. The departmental city Lai-chau fu, or Edible-plant city, a place of no importance, and having a small coasting trade, is said to be in lat. 37° 13′ N., long. 119° 50′ E., and to stand near the eastern point of the mouth of the Kiai ho. There is a fort and high craggy cliffs a little to the eastward. The city was neither visible with a glass from the summits of Quoin island nor the Saddle, although its position was pointed out by the Chinese. The Tigers head cliff, Hu-tau-yai, probably that mentioned above, is about 8 or 9 miles south of Quoin.

"Passing along the coast, the next point of communication with the sea eastward of San-san is the mouth of the river Wei. Here no steamers

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could possibly get nearer the coast than three or four miles, according to the Admiralty chart of 1860, as the soundings at that distance from shore show only one fathom. The river Wei itself is only navigable for northern boats and all the cargo that goes by junks to Wei-hyen passes by the small river Shai-Yui.

"From all the most reliable information that can be gathered, no communication by steamboat between Chifu and Wei-hyen is possible. The city of Wei-hyen contains 150,000 inhabitants. It is a very considerable depôt for foreign trade, and certainly ranks next in importance to Tsi-nan-fu the capital of Shantung.*

From Lai-chau to the Li-tsin ho or Yellow river, a distance of 60 miles, the coast is extremely low and skirted by sand-banks H.M.S. *Dove* passed along the shore at about three miles' distance in a depth of 6 feet, but ships of 24 feet draught would not be able to approach within 10 or 20 miles southward of that river.

The TA-TSING HO or LI-TSIN HO, the present outlet of the Yellow river, has its entrance in lat. 37° 53′ N., long. 118° 36′ E. The source of the river is said to be in lat. 36° 20′ N., long. 117° 40′ E. It rises on the slopes of the Tai-shan, one of the highest mountains in China, and runs westward 70 or 80 miles, then turns north-westward a few miles to where is situated the town of Yu-shan, within five miles of the Grand canal, where it makes a sharp bend to the north-east, in which general direction it continues to the sea about 200 miles distant by the windings of the river. Tsi-nan fu, the capital of Shantung, stands four miles south of the river at about 135 miles from the sea and 75 from the canal, but there is little known concerning it.

Ta-tsing ho signifies Great Pure (or clear) river. Its waters are now laden with yellow mud or clay, caused by the irruption of the Yellow river into its bed, and that torrent now fairly occupies its channel, having established the Ta-tsing as its outlet since 1851.

The entrance† of the river is known to the junkmen as Li-tsin kau; they also term the river Li-tsin ho, after a town of that name (Profitable ferry) about 35 miles from the entrance. On the northern point of entrance, round which the river takes a very acute bend, is the village of Miau-shin-pu or Lau-ye-miau, consisting of a few mud hovels, but the only habitable spot for many miles in every direction. Above, for nearly 40 miles is a desert of mud covered with reeds, dry in winter but inundated in summer.

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* Shanghai paper.

† *See* Sketch of the entrance of the Ta-tsing ho, scale, m = 1 inch, on Admiralty Chart of the gulfs of Pe-chili and Liau-tung, No. 1,256.

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The Bar, when surveyed in 1860, was 3 miles from the entrance of the river, and had a depth of from 2 to 3 feet on it at low water springs. The channel flowed in a north-easterly direction through the mud banks (the bar being half a mile within the outer limits of them), and was well marked with large stakes or beacons. The depth over the bar at high water springs would therefore be 12 to 13 feet. In 1863 the bar was again examined by a person* sent expressly for the purpose from Shanghai and was then found to be 1½ miles wide, and had only 10 feet on it at high tide. The river since then has brought down enormous quantities of soil and formed a large bar at its entrance. In 1867 the large junks that formerly traded there were unable to get into the river from the sea. In 1868 the Yellow river brought down still more soil in its waters, and no accurate account of the depth of water to be depended on at the bar, could be had from the coasting junk owners.

In 1868 the bar had only 4 feet over it at high tide, but had a channel on either side, that on the south carrying 7 feet, and that on the north 5 feet. This was the report brought back by an exploring party,† the state of this bar having excited a great deal of interest among residents in China, because on the depth of water to be found there hinged, it was believed, the navigability of many hundreds of miles of the river into the interior.‡ This last account of the condition of the bar did not proceed, however, from examination of it but from inquiry made of the pilots. The remarks on the tides were obtained in the same manner, being to the effect that the average rise and fall was 2½ feet, but which is very improbable. Supposing it, however, to be the case, and the bar to be raised 2 feet above the level of low water springs, there might be found at high water springs a depth of 8 feet, and at neaps 5 or 6 feet.

The northerly gales of winter which beat the coast of Shantung from November to March will keep up the deposit of the Yellow river at its juncture with the gulf of Pe-chili, and it is possible that in a few years another coast may here be formed, that will upset all present ideas of the locality about which there is now question. It may be safely concluded that since the Yellow river, with its capricious and overwhelming floods, has made its bed where the Ta-tsing ho flowed, no reliance can be placed on a permanent channel for steamers to pass into the interior of Shantung through its waters.

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* *Anon.* Extract from an English newspaper published in China in 1868.

† Conducted by Mr. Ney Elias of Shangai; *See* "Journal of the Royal Geographical Society," Vol. XL., 1870, page 1, where is given a full description of the Yellow river, and its recent changes.

‡ There exist greater obstructions at Tsi-ho-hien, 120 miles from the river's mouth.—*Ibid.*

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Tieh-mun-kwan,* the highest point to which the junks ascend and trade, is about 15 miles above the village at the entrance of the river. Though itself only a village composed, like others in the neighbourhood, of mud built houses, it has every appearance of being a very important place. It is not a centre of trade, but consists chiefly of hongs to which traders from the different towns within reach come to transact business, except during the winter months when the river is closed by ice, and then it is said to be nearly deserted. Although called a port, Tieh-mun-kwan is only used as such by small Pei ho and river junks, larger junks, such as those from Ning-po, Shanghai, Swatow, &c., remaining at the anchorage outside the bar, where they discharge their cargoes into river boats, and receive their homeward freights by the same means. The direct trade, existing between places high up the river and Tien-tsin, Chi-fu and other ports on the gulf, is carried on by junks of a lighter draft and different construction to the sea-going junks of the southern provinces, but well suited to the rivers and shallow seas on which they are employed. These journeys are performed by coasting round the gulf, and as the water for some distance from the shore is very shallow the sea never rolls in heavily, and it is always possible to anchor in the event of a foul wind.

The principal trade of Tieh-mun-kwan is with Tien-tsin, though junks bound to and from all parts of the gulf are to be found there. The exports are chiefly salt, cotton, dates, &c.; the imports paper, timber, sea-weed, beans, sugar, and a few British cotton goods and lead. More than three-fourths of the whole export trade is salt, which is largely manufactured in the neighbourhood.

This place is at the lower limit of the habitable region. Between it and the sea is one immense mud-flat stretching away far on both sides of the river, which in the summer is for the most part covered with reeds which are collected for fuel by a race of miserable reed-cutters, and which is the resort of vast number of wild fowl, swans, geese, pelicans, &c.; when the river is in flood this tract is totally submerged.

Anchorage.—The anchorage outside the bar, in 2 or 3 fathoms at low water, is called Tai-ping-wan, where the larger trading junks, which cannot cross the bar to enter the river, remain during the transhipment of their cargoes. Smaller junks lie within the entrance points of the river, eastward of the village and on the same side. Tieh-mun-kwan is the highest place to which they ascend for the purposes of trade.

TIDES.—It is high water, full and change, off the Ta-tsing ho at 4h. This observation is imperfect but agrees with other tidal observations made between this and the Pei ho, *see* page 624. At neaps, when the river is

* Iron Gate Pass.

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not in inundation, the flood tide is said to be perceptible about 10 miles up the river, and at springs, occasionally, as high up as Tieh-mun-kwan. According to information obtained in 1868 by Mr. Ney Elias the average rise and fall of tide inside the bar was 2½ feet, more at springs and less at neaps. According to the actual observation by tide gauge in 1860, at 15 miles to the north-westward, Lieut. Bullock recorded the rise at neaps as 8 feet, whilst the spring rise off the Chi ho, by tide gauge also, was 10½ feet. If both accounts be correct it follows that the bar and estuary are raised above the level of low water, and this raising of its bed is a peculiarity of the Yellow river noticed centuries ago*; and it is known that the bar of the Chi ho, a few miles to the north-westward, is 2 feet above the level of low water. Outside the bar the rise at springs may be taken to be 10 feet, at neaps 7 feet.

NAVIGATION OF THE TA-TSING HO.†

The Ta-tsing ho, Li-tsin ho, or Yellow River outlet would be navigable, for vessels able to cross the bar, up to Yu-shan, 227 miles from its mouth, were it not for two obstructions, a shoal and a ruined bridge, 174 and 177 miles respectively from the sea, for except at those places nowhere was less than 2 fathoms found in the channel of the river during its exploration in October and November 1868.

BAR to TIEH-MUN-KWAN.—Depths of 2½ to 6 fathoms may be carried in the channel of the river except at two parts, the first of which is situated 3½ miles above the village of Lau-ye-miau at entrance, just before arriving at the first very sharp bend, where there is a shoal of 6 feet, and the position of the channel, said to be 2 fathoms in depth, is not known. The second shoal spot, of 9 feet, is about 2 miles below Tieh-mun-kwan. At entrance the river is 800 yards broad, but at Tieh-mun-kwan it has decreased to 525 yards. This place is described at page 511. The summer rise here is about 4 feet, and the current in November runs from 2½ to 3 knots.

TIEH-MUN-KWAN to LI-TSIN is 27 miles. Above the long straight reach, at the lower part of which Tieh-mun-kwan stands, the river becomes very winding, with a breadth of 300 yards, and a depth varying from 3 to 6 fathoms; there are shoals off all the points and also in several of the bights. The aspect of the country through which the

* *See* Biot's "Memoir on the Changes of the Yellow River," (Royal Geographical Society).

† Abridged from *Notes of a Journey to the New Course to the Yellow River*, with chart, by Ney Elias, Esq., F.R.G.S., published in the "Journal of the Royal Geographical Society" for 1870, vol. XL. The distances of the principal places from the bar are given at page 621.

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river runs, up to within a few miles of Li-tsin, is that of a bleak, swampy, treeless waste, scarcely fit for man to dwell in. Nevertheless, on the banks are villages at short intervals, occupying a belt of land on either side which is fairly habitable, and off which the annual flood drains naturally. A few miles below Li-tsin the country begins to change its character, the boundless tracts of mud and marsh, but poorly cultivated and thinly inhabited, giving place to a well-wooded and well-cultivated district above.

Li-tsin (hien), which is 42 miles from the sea, appears to be of no great importance as regards trade. The river has here made a remarkable inroad into the city. Situated on the left bank, on the concave side of a sharp bend, the swift current has cut its way through the foreshore and carried away some hundreds of feet of the south-west angle of the city wall, some of the ruins of which and outlying buildings were in 1868 visible above water in the middle of the river, but they are no obstacle to navigation, there being a 7-fathoms channel within a few yards of the ruins, towards the right bank.

LI-TSIN to LO-KAU.—Eleven miles above Li-tsin is the village of San-cha, on the south bank. In this stretch of river the bights are very angular, and are often shoal as well as the points. The depths are from 3 to 9 fathoms, and the river is about 250 yards wide.

Ten miles above San-cha is Pu-tai. In the intervening portion of the river the depths vary from 5 to 16 fathoms.

Pu-tai (hien), on the south bank, is a small and apparently poor place of trade, and were it not the site of the principal custom house on the river it would scarcely be worth notice.

At 7 miles above Pu-tai the summer rise is about 15 feet. The bights now cease to be angular and shoal, the depths in the channel are 5 to 9 fathoms, and the river contracts to 200 yards. Tsing-ho-chin stands on the north bank 41 miles above Pu-tai; the depths between them are 6 to 8 fathoms.

Pelung Rapid is 2¼ miles above Tsing-ho-chin. The passage, which is 4 fathoms deep, is, according to the map, close south of the northern rock or islet of the rapid. Above and below, the depths are from 6 to 10 fathoms, and the river's breadth 180 yards.

Tsi-tung (hien), on the north bank, is 14½ miles above Tsing-ho-chin. It is a large, busy, and apparently thriving place, and would probably rank next to the capital in the matter of trade, although it certainly surpasses Lo-Kau in every attribute of a port. There are four consecutive sharp bends commencing 5 miles above Tsi-tung.

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Tsi-yang (hien), on the north bank, 25 miles above Tsi-tung, is a place of no importance whatever. Between the two towns the depth of the river is 4 to 12 fathoms, and its breadth 180 to 200 yards. Above Tsi-yang and up to Lo-kau the depth is from 8 to 10 fathoms, and there are four sharp bends commencing about 10 miles above the former. At 6 miles below Lo-kau is seen the first hill near the river bank; it is about 220 feet high, on the south side, and a short distance inland. From 2 to 5 miles above this several low hills are seen on both banks, and Lo-kau lies between them. The mountain ranges seen to the southward, 7 miles from the river, continue as far as Yu-shan. Up to this from below Pu-tai the river has run through a low, level, but well wooded and cultivated country.

TSI-NAN FU and LO-KAU.—Tsi-nan fu is the capital of the province of Shantung. It stands about 4 miles from the river, to the south, and not far from the foot of the main range of hills, which hereabouts average from 800 to 1,200 feet in height, and form a rather picturesque back-ground to the low, thickly-wooded plain upon which the city is built, and which extends for many miles on both sides of the river. This plain is alluvial, but there rise from it here and there in this neighbourhood several small, wedge-shaped, jagged hills or masses of rock.

Lo-kau, 24½ miles above Tsi-yang, is the seaport of the capital. It is a long, straggling, unwalled town on the south bank. The trade of Tsi-nan fu is said to be of great importance, and carried on chiefly by means of cart roads. The number of boats seen at La-kau was not large, and many of them appeared to be only passing to the Grand canal. The only article of commerce noticed in any quantity was salt, which had come up the river from Tieh-mun-kwan. Coal is met as an article of trade both here and at other places on the Yellow river; it is of a rather bituminous nature, and is sold at 1,200 cash the picul. The principal mines are said to be at Tsan-fan, a place in the hills, 90 li to the eastward, where the coal is sold at a much lower price than at Tsi-nan fu.

LO-KAU to YU-SHAN.—Above Lo-kau the breadth of the river increases again to 250 and 300 yards, the rate of the current is about 4½ knots in October, and the summer rise is estimated at from 15 to 18 feet.

Tsi-ho-hien Bridge and Shoal.—Tsi-ho-hien, 8½ miles above Lo-kau, a small, newly-walled, unbusiness-like looking place, is the site of a serious obstruction in the river. This consists of the ruins of a stone bridge of some seven arches, which at one time spanned the Ta-tsing, but would now only reach about three-quarters of the distance across the river. There is a space between the left bank and one extremity of it of about

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100 yards, the deepest channel being close under the bank, where was a depth of 5 feet on October 21st, 1868, and no stones to be felt with the lead. The outer portion of the 100-yards channel would probably not be practicable even at 3 feet. The bridge evidently stands in deep water, 6 fathoms having been obtained immediately above it, and 5 fathoms a short distance below it. The right bank is naturally the steep one, and the left (near which is the channel), the shelving one, and the shallow side of the reach. This bridge being now nothing but a wreck is due to the additional force and volume of water in the river for the last 15 years, which it has been unable to withstand.

It is evident that the ruins of this bridge might be removed, and if no other obstruction existed, the river rendered navigable as far as Yu-shan, or within 19 miles of the Grand canal. Unfortunately, however, about 3 miles below this there occurs another, though a less formidable, obstruction in the shape of a shoal extending right across the river. In this case, too, the deepest side of the reach is the right, and here on the 21st October only 11 feet was found, the bottom rising gradually towards the left bank. On the 6th November, when the spot was passed a second time, there was but 5 feet of water in mid-stream, and allowing for a fall of 4 or 5 feet in the level of the river in the interval, there would be only 6 or 7 feet in the deep passage near the right bank. The shoal was estimated at 200 to 300 yards in length, and was the only place above the bar where less than 2 fathoms was found in the deep channel of the river.

Kuang-chuang is 18 miles above Tsing-ho-hien, and the depths 6 to 7 fathoms throughout. Here the river is 200 yards broad, and the current runs 4½ to 5 knots.

Ping-yin-hien Shoals are 17 miles above Kuan-chuang. They are marked 2 fathoms on the map, but there is no description of them. Hua-kau is a town 7 miles above the shoals. A little above Hua-kau are three small elevations on the north bank, and 8 miles above it is Yushan.

YU-SHAN, 19 miles from the Grand canal, is the point where the water of the Yellow river, expanded and spread over the plain some 90 miles south-westward, without a channel deeper than 3 feet even in the season of inundation, but ever moving with a swift onward current; converge, and the deep, narrow, clean-cut river bed, which receives them, and leads them to the sea, is the same which fifteen years ago formed only the bed of the Ta-tsing, in which there are many indications of its becoming each year both wider and deeper.

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The following are the distances of the principal places and shoals of the river from the sea : —

Bar to Lau-ye-miau	4 miles.	Bar to Lo-kau (port)	168 miles.
„ Tieh-mun-kwan	15 „	„ Tsi-man (fu)	172 „
„ Li-tsin (hien)	42 „	„ Tsi-ho shallows	174 „
„ San-cha	53 „	„ Tsi-ho-hien bridge	177 „
„ Pu-tai (hien)	63 „	„ Kuang-chuang	195 „
„ Tsing-ho chin	104 „	„ Ping-yin-hien shoals	212 „
„ Pelung rapid	106¼ „	„ Hua-kau	219 „
„ Tsi-tung (hien)	119 „	„ Yu-shan	227 „
„ Tsi-yang (hien)	144 „	„ Grand canal	246 „

During the time H.M.S. *Dove* was anchored off the Ta-tsing-ho in Dec. 1860, the tide ran out for 8 hours, and was still making out when she left; this was at neaps.

From 15 miles north of the Ta-tsing-ho, the flood sets to the north-westward along the coast, and the ebb to the south-eastward, turning, but not very regularly, at high and low water, which is about the same time as off the Pei ho, observations being made at the above place, and also at 20 miles N.E. of the Ta-ko ho; but at the Lau-mun-sha banks, near the shore in lat. 38° 7′ N., the flood set south and the ebb north. Again, 10 miles east of the bar of the Li-tsin the flood set N.W. for 5 hours and the ebb S.S.E. for 7 hours, and 10 miles further east, the flood set N.W. 4 hours, and the ebb East, 8 hours. In the Lai-chau bight the tides are very weak.*

DIRECTIONS.—If the Yellow river produces in the gulf of Pe-chili, similar sand banks to those it formerly created in the Yellow sea, the approach to this river will from year to year become more difficult. There is no record of any change since the year 1860, when it was clear of approach from North and N.E., although there were indications of a bank of 15 feet, 3 miles East of the outer or Tai-ping-wan anchorage. Since the junction of the Yellow river with the Ta-tsing ho, its waters have been laden with yellow clay which has been deposited in vast quantities at its mouth, and in which the lead sinks from 4 to 6 feet, and so remarkably soft is this clay bottom that H.M.S. *Odin*, drawing 16 feet, was able to steam through it into 12 feet water, and to go ahead or astern at full speed with ease, but yet was unable to turn, and was at last compelled to back out for 2 miles before she could do so. The bar, described above, would require examination before entering.

* The observations on the tidal streams in the offing are by J. M. Hockly, Esq., Master, R.N., H.M.S. *Odin*, 1860.

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LAN-MUN-SHA (Barrier Gate sand) is the name given by the Chinese to a sand-bank 27 miles N.W. by W. from the Ta-tsing ho bar. In surveying this coast H.M.S. *Dove* near high water got amongst a maze of sand-banks in lat. 38° 8′ N., long. 118° 11′ E., and was ashore for 30 hours. There are indications of shoal water 7 miles to the eastward of this position. Two wrecks were seen between this and the same river, the only wrecks ever met with in the gulfs.

The TA-SAN HO.*—From the Li-tsin ho to the Ta-san ho the low shore is extremely irregular in outline, broken by large openings, and to all appearance utterly devoid of vegetation, and sand-banks extend in some places 3 or 4 miles off it. The Ta-san river is smaller than either the Li-tsin or the Pei ho. Close off its east point of entrance, called Ta-sa-kau or Ta-kau, is a low island on the western point of which is a village, and on the eastern the Siau-shin miau (Little Spirit Temple) amongst some trees and sand hills. The channel takes a northerly direction through the outside banks, the bar (having 1½ to 2 feet water in December in 1860) being at its outer part, and marked by a beacon on one side of the channel.

The Ta-san ho is called on old maps the northern estuary of the Laou-hwang ho or Old Yellow river, one of the outlets of which it has been at several periods, (although the Ta-tsing ho appears to have been the principal one) since the eighth century before the Christian era.† It is also called Ta-ko ho.

Supplies.—In December 1860, there were six Shanghai junks inside the bar loading with prunes, and several small Tientsin vessels. The junkmen said there was a small town called Shing-tsi-kiai at 50 li (17 miles) up the river, and that the district city of Hai-fung or Hai-ping was 150 li or 100 miles higher up; at which places a small trade was carried on, the chief imports being corn, and the only export a kind of prune of a red colour called hüng-tsau-urh. This river is the boundary between the provinces of Chili and Shantung.

ASPECT of COAST.—In coasting along this shore in hazy weather its appearance is very peculiar, all objects being ridiculously magnified. The small villages start out of the mist like huge towns, and men loom like towers, whilst the shores vanish on either hand in long, finely tapering points.

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* *See* Sketch of the entrance of the Ta-san ho, scale *m* = 1 inch, on Admiralty Chart of Gulfs of Pe-chili and Liau-tung, No. 1,256.

† Memoire sur les changements du cours inférieur du fleuve Jaune, by M. Ed. Biot, 1843.

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The description of one of these villages named Tang-tau pu will suffice for all. It contained 30 mud hovels situated on a sand heap about 10 feet above the level of the surrounding country, which was perfectly flat and very sandy, growing a coarse kind of grass which the natives collect for fuel. The country around was totally uncultivated, the villagers stating that in consequence of there being so much sand and salt in the ground no plants would grow. Their chief article of diet was a kind of cake made of the seeds of a wild plant called by them Hwang-seu. They described themselves as wretchedly poor, gaining their livelihood by fishing during the summer months, but that in the winter the fish deserted their shores, and the sea near the coast was frozen to the depth of 3 to 6 feet.

These villages are built on the sand so insecurely that gales sometimes destroy them. At Siau-tsin pu a large village, in 38° 24′ N., the high tides sweep the adjoining country in summer, but in winter, owing to the sea near the coast being frozen, the water does not rise over the beach. They dry the Kala, a species of cockle, and sell it to the Canton and Fokien junks, under the name of Han-kan. The shells of a very large species of oyster, called Muli, is also collected for sale to the druggists, it being supposed to have medicinal properties. Its habitat is a small stream, south of the Ta-tsing ho, in lat. 37° 36′ N.; the stream is not navigable.

The CHI HO.—Between the Ta-san ho and the Chi ho the sand plain is somewhat higher, and the beach steep at high water; at low tide it would dry about a mile out. Chi-kau is a small village on the south point of entrance of the Chi ho, inhabited by fishermen in a condition of abject poverty. Junks of 5 to 20 tons bring millet from Tientsin in exchange for fish. The surrounding country is totally uncultivated, and at Chi-kau its appearance is uninviting and desolate in the last degree.

The Chi ho, into which no fresh water stream enters, is a salt-water creek, which enters the sea through the banks in an easterly direction by a narrow tortuous channel, about 3 miles in length, and 40 to 50 yards wide, having a bar outside nearly dry at low water. It runs up about 3 miles to some villages, is 60 to 70 yards wide, and carries 15 to 16 feet water inside the entrance, which is a cable broad. The springs rise about 9 feet, the neaps 7 feet.

The anchorage off this river is open from North to South. The water is very shoal, there being only four fathoms at 8 miles, and 2 fathoms at 2 miles from the entrance. There are also shoals of 7 feet at 4 miles from the mouth of the river; a clump of trees bearing S.W. ½ W. clears the north shoal. Small vessels can close the shore at half tide on that bearing to about 1½ miles, in 12 feet water. The passage over the bar should not be attempted without previously buoying it; and it is not safe for a boat

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to come down from Chi-kau on the ebb, after sunset, unless the banks are uncovered sufficiently to define the deep-water channel which is very winding.

COAST between the CHI HO and the PEI HO.—Between the Chi ho and the Pei ho the soundings are still shoal, and the depths only 4 fathoms at 7 or 8 miles from the coast. The sands dry out at low water to a distance of 1½ miles, and are so hard that men can walk on them without inconvenience. About 8 miles south of the Pei ho there is an inlet which may be mistaken for a river, and into which the water flows at half flood. At two places between the Chi ho and Pei ho the sea overflows the shore at very high tides, but only to the depth of a few inches; the country inside is a plain of sand, apparently dry, except a few places which are inundated at the top of the tide, and is almost entirely uncultivated. There appears to be almost an unbroken line of sandy beach at the high-water level, raised sufficiently to be above the influence of ordinary tides. For 5 or 6 miles south of the Pei ho the edges of the mud flats are covered with small fishing weirs.

TIDES.—It is high water, full and change, off the Chi ho at 4 h. and off the Ta-tsing ho and the Lau-mun-sha, about 4 h. 10 m. At the former place springs rose 10½ feet; at the latter, neaps 8 feet. At 20 miles off the coast, it is high water half an hour earlier. Near the shore the tidal streams are very weak.

The Chi ho bar must be quite 2 feet above the level of low-water springs, for the tide rose from 2 to 3 feet outside before it began to rise on the bar, on which a depth of 4 to 6 inches remained during 3 hours. In the river the ebb tide ran 9 hours.

SHA-LUI-TIEN ISLAND and BANKS.—*See* page 641.

THE PEI HO OR TIENTSIN RIVER.*

The PEI HO or White River, called also the Tientsin ho, is the largest stream between the Yellow river and the Great Wall, and drains all that part of the Great Plain east of Shan-si and south of the edge of the table land, its various branches affording water communication through most parts of Chili. Its extreme length from its source to the sea is about

* *See* Admiralty Charts:—The Coast from Chi-kau to Ning-hai, including the Pei ho, and Sha-lui-tien banks, No. 2,732, scale $m = 0{\cdot}2$ of an inch. Also the Pei ho, from entrance to Tientsin, Sheets 1 and 2, Nos. 2,653, 2,654, scales $m = 2{\cdot}4$ inches; Tientsin to Tungchow, and Tungchow to Peking, Nos. 257, 258, scales $m = 2{\cdot}2$ inches.

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270 miles. The Pei ho is the great highway to Peking, the capital of China. The important city and treaty port of Tientsin also stands on this river at its junction with the Grand Canal, of which it is the northern terminus. More correctly speaking, it is the Yu ho which joins the Pei ho at Tientsin, which river rises near where the Yellow river enters the Great Plain, about 300 miles to the south-westward, the Grand Canal joining the Yu ho about 150 miles to the southward.

The Pei ho, running through an alluvial country is very tortuous, the distance from the Ta-ku forts to Tientsin being 30 miles by land and 50 by water. It has the same characteristics as other similar rivers, being deep off the steep banks and shallow off the shelving ones. No peculiar difficulties were formerly experienced in its navigation, from the entrance up to Tientsin, but owing to the numerous canals recently constructed and connecting with this river, extreme care is now required. Vessels drawing more than 10 feet water must expect to touch the ground constantly, unless they have sufficient speed to traverse the whole distance between Ta-ku and Tientsin at high water. There is but a narrow gutter along which deep-draught vessels can pass, and the pilots themselves cannot always keep vessels from grounding.* With long vessels there are some points which will require the nicest care and skill in turning.† For a vessel drawing more than 8 feet there are two places that must be passed at high water. One of these shoal places, having only 7 feet water at low tides, is off the brick-kilns about 9 miles below Tientsin; the other, of 6½ feet, is in the long broad reach, 3 miles below the city.

At Tientsin the river is 200 feet wide; above this it soon contracts and becomes too shallow even for gun-boats. The *Kestrel*, of 6½ feet draught, ascended it about 6 miles, and found a reach with only 4 and 5 feet in it at high water, the rise and fall of tide there being 3 to 4 feet. From Tientsin there is a water communication to Tung-chow by means of large boats and rafts to within 10 miles of Pekin. Small junks from the Grand Canal navigate as far as Yung-liang-hien, 55 miles above Tientsin.

Tientsin (heavenly ferry) stands at the junction of the Yu ho and Pei ho, which meet east and west, their comingled waters flowing directly

* Abridged from Captain's Remark Book, H.M.S. *Sheldrake*, 1882.

† Some of the bends are very sharp, especially above Pai-tang-ko, but bollards are conveniently placed on the banks, to which vessels can secure hawsers, and steam round on, still it is necessary to be very careful, as the banks have extended and narrowed the channel considerably in most of the bends. In May 1882, H.M.S. *Vigilant* (drawing 11 ft. 1 in.) got aground no less than four times, and eventually had to be secured just above "Double bend," the pilot stating that not more than 10½ feet could be carried in the Tientsin reach. There was only just sufficient room for the *Vigilant*, (230 feet long,) to turn in the reach above Double bend.—Remarks of Lieut. A. G. Tate, R.N., 1882.

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south; the former, here called the Yun-liang ho, having run a course of 300 miles, the latter 220 miles. The walled city stands at the south-eastern corner formed at the junction, and is about a mile square, its suburbs extending east and south along both shores of the rivers for about 2 miles.

Tientsin is a treaty port and has a consular establishment. It is the sea port of Peking, and the largest and most important city in the north of China. It has trade with Siam and Cochin China, as well as with all the ports of China. Both strategically and commercially it is the key of the capital.

Tung-chow is 90 miles above Tientsin by water and 63 miles by road. All boats here unload their passengers and cargoes, which are conveyed by a broad avenue, 11 miles long, to the capital. Its streets are straight and paved, with raised footpaths at their sides.

The BAR of the Pei ho,* the Chinese name of which is Lan-kiang sha, is about 2 miles in length, in a N.W. by W. and S.E. by E. direction, and consists of hard mud.

The shoalest part of the bar is about half a mile outside the entrance buoy.† About the middle of the channel, at $2\frac{3}{4}$ miles S.E. by E $\frac{1}{2}$ E. of the south cavalier of the south fort, there is an elbow or bend in the fair-way, at which part there are only $1\frac{1}{2}$ feet at low tides, but the bottom is very soft mud. Farther out there are 2 feet, but the bottom is hard mud, or sand, so that vessels that can cross this can also pass the elbow, although in less than their own draught. At the entrance to the bar, the northern banks, like those of the Peh-tang, are of hard sand, and like them also tail away to the southward.

At high water springs $10\frac{1}{2}$ feet is the utmost water that can be depended on over the bar, the height of the tide being much influenced by the direction and force of the winds; at neaps, there is at times as little or less than 6 or 7 feet at high water. In November, the channel of the bar becomes somewhat shallower, and harder than in the early part of the season, the outer part becomes as shoal as at the elbow, the whole channel much narrower, and uneven, being full of knolls of 6 to 12 inches elevation, and the northern spit much elongated. Few vessels attempt to enter after the last days of November, for the river is generally frozen over early in December, and remains so till early in March. The banks off the coast dry out $1\frac{1}{2}$ miles, but on the borders of the channel they dry out 4 miles. They are of very soft mud, and steep towards the river as far down as the elbow,

* *See* Admiralty Chart of the Pei ho, from the entrance to Tientsin, Sheet 1, No. 2,653; scale, $m = 2{\cdot}4$ inches. The harbour-master of Taku reported, in 1869, that the Admiralty survey of 1860 was then incorrect.

† Navigating Officer's Remark Book, H.M.S. *Sheldrake*, March 1882.

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their edges always uncovering first. The tail of the northern bank is uneven and of hard sand, which appears to be drifted into the channel by northerly gales. The banks are not always easily distinguished when covered, for at high springs the ripples over them are not visible.

LIGHT, BUOYS, and BEACONS.—Outside the bar and moored in 17 feet of water, is a light-vessel with one mast 37½ feet high, painted red, and surmounted by an 8 foot black ball. She exhibits a fixed dioptric light, visible 10 miles in clear weather.

This light-vessel (which is only in position from the opening of the river to the 30th November) has "TAKU" on her sides. In foggy weather a gong will be sounded at *one minute* intervals. To show the direction in which the light-vessel is riding, a *white* riding-light will be exhibited from sunset to sunrise from the fore-stay, at 6 feet above the rail. *

Three buoys mark the passage over the Taku bar, and six beacons mark the banks of the river, three on the north side, and three on the south.

Entrance Buoy is a *red* buoy, with black cage, on the outer edge of the bar, to mark its commencement and the entrance of the channel.

South Buoy is a *black* iron buoy, on the south side of the bar, to mark a bend in the channel.

Inner Buoy is a *red* iron buoy, on the inner end of the bar, to mark the inner entrance to the channel.

These three buoys are moored in from 2 to 4 feet of water.

Wooden Beacon, pyramid shaped and painted *white,* is on the north bank at the mouth of the river.

North Bank Marks are two 30 feet poles with cages, on the north bank at the mouth of the river.

South Bank Marks are two poles 30 feet high with cages, on the south bank near the mouth of the river.

South Bank Mark.—A board painted, one half black the other half white, on two poles 20 feet high, on the south bank near the China Merchants' Steam Navigation Company's godown.

It marks the channel after rounding the red buoy.

These buoys are removed before the river becomes frozen up, and the channel is re-buoyed every spring. They are often washed away.

* If the light vessel be driven from her moorings a fixed red light will be shown at each end of the vessel in place of the usual white light. The ball will be struck, and until struck, will be surmounted by a *red* flag.

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ANCHORAGE.—Vessels of large draught, say 24 feet, may lie in nearly their own depth about 8½ miles from the forts, the mud being very soft, so that they may ground at low water. The best position is at that distance, S.E. by E. of the south cavalier, the left and largest of the five seen. This will be about 4½ miles from the bar. Vessels of less draught can choose their own depth upon the same bearing, finding 15 feet at 1½ miles from the bar. A vessel anchoring in 8 feet more than her draught at half tide, would have from 2 to 3 feet to spare at low water springs.

The holding ground at this anchorage is excellent. A heavy gale brings in an unpleasant sea, yet with good ground tackling and plenty of cable out it is considered that a sailing vessel ought to ride out a summer gale. The anchorage seems to be a wild one in winter; in the gales of November, some boats only were lost. At a later period ships cannot anchor there at all, owing to the ice.

Sometimes vessels anchor in their own draught of water, for the mud is very soft, and if the wind sets in from seaward the level of the sea is raised, whilst with off-shore winds which diminish the depth of water the sea is always smooth. The difference of level between high water spring tides with a south-easterly wind, and low water springs with a north-westerly wind is 12½ feet, the spring rise being 10 feet.

The anchorage, called officially the Outer anchorage extends from the Customs' junks to 3 miles outside the bar seaward.

The Pilot Association have constructed a strong temporary pier at which vessels drawing 9 feet water can lay at low water. This pier is removed when the river closes, and replaced in the spring.

PILOTS,* Divers.—Efficient pilots certificated by Her Majesty's Consul, are usually on the look out for vessels entering during the open season. The rate of pilotage to Tientsin is about 8 dollars per foot of draught.

The native divers are very skilful. They have been able to recover boxes of specie from a depth of 25 feet. As gales sometimes come on in a few minutes without the slightest warning, boats alongside are liable to be stove or damaged.

TIDES. At Taku.—It is high water, full and change, outside the Pei ho bar at 3 h. 30 m.;† ordinary springs rise about 10 feet, neaps 7½

* Lieut. A. G. Tate, R.N., of H.M.S. *Vigilant*, states that in 1882 there were about 12 European pilots for the Pei ho river, living at Taku. These pilots who had formed a company owned a steam tug and several lighters. H.M.S. *Vigilant* paid for a tug to tow the ship's head round the bends 200 dollars; and for her pilot 88 dollars.—Remark Book, *Vigilant*, 1882.

† 3 h. 40 m. by the observations of Com. J. Ward, R.N., 1860; 3 h. 10 m. according to the survey of M. Ploix, of the French Imperial Marine.

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feet. The actual time of high water sometimes varies as much as 1½ hours from the computed time, but seldom at springs. As soon as the flats are covered, the tide sets across the bar along the coast nearly parallel thereto, the flood running northward, the ebb southward,* about 2 knots at springs, and one knot at neaps. On the bar the tide is always weak. The influence of the direct tides in and out is not felt on the bar except towards low water, when the stream is confined within the mud banks. Outside the bar, the flood sets North, the ebb S.S.E. The tides are subject to great irregularities. North and N.W. winds retard the flood and diminish its rise; East and S.E. winds increase the rise and retard the ebb. Slack water sometimes lasts 3 to 4 hours at the neaps. The rate of the tide in the river is 2 to 3½ knots, its maximum 4½ knots.

Dock.—A dry dock, reported to be 390 feet long over all, 300 feet long on the floor, 40 feet wide at the entrance, and capable of admitting vessels drawing 13 feet, is in course of construction at Taku.†

At Tientsin it is high water, full and change, about 7h. 0m.; it is estimated to be about 4 hours later than Ta-ku, but varies very considerably. The average rise and fall is 3 to 4 feet, and the greatest range 6 feet. When the snows melt the river is said to rise 2 or 3 feet higher. The times of high and low water are irregular; the water will sometimes remain at its high level for 3 or 4 hours. The tide takes 6 hours to rise and the same period to fall, but at the forts which stand some miles below Tientsin, the flood steam ran only 4½ hours at springs; the ebb therefore must have run 8 hours. At the above forts it is high water, full and change, at about 5h. The tide ceases at Yong-tsun, 23 miles above Tientsin.

The flood tide has a velocity of about one knot and continues to flow up for an hour after high water; the ebb has a velocity of 2 knots and runs out until two hours after low water. At times when it has been blowing from the northward there is scarcely any rise of tide and the stream is then always making down.

Tide Signals.—The following signals are made from a flagstaff with yard to show the depth of water on the bar, the starboard yard arm being the northern one.

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* According to Lieut. Pollard, R.N., the exact reverse is the case. The flood tide running to the southward, and the ebb tide to the northward.—Captain's Remark Book, H.M.S. *Zephyr*, 1882.

† In 1880. By subsequent information it would appear that this dock is now open and capable of holding two of the small Chinese gunboats.—Commander Collins, H.M.S. *Swift*, November 1881.

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At masthead :—

Ball	signifies - - -	Slack water.
Red flag	„ - - -	Rising tide.
Two balls	„ - - -	Falling tide.

At starboard yard arm, accompanied by red flag at masthead :—

Triangle	signifies - - -	8 feet on bar.
Triangle over ball	„ - - -	8½ „
Ball	„ - - -	9 „
Ball over triangle	„ - - -	9½ „

Triangle hoisted alone at *starboard* yard arm, with the following signals at *port* yard arm, signifies an additional half foot of depth.

At port yard arm :—

Triangle	signifies - -	10 feet on bar.
Triangle over ball	„ - - -	11 „
Ball over triangle	„ - - -	12 „
One ball	„ - - -	13 „
Two balls horizontal	„ - - -	14 „
Two balls vertical	„ - - -	15 „
Three balls	„ - - -	16 „

The following signals are also in common use in the Pei ho River :—

"I am at anchor" - -	Anchor light, and 3 white lights at peak or ensign staff.
"I am on shore" - -	Anchor light, and 2 perpendicular lights at peak or ensign staff; and whilst attempting to get afloat, the usual steaming lights exhibited in their proper places.
"I am on shore, and the channel is blocked so as to render passing dangerous."	Anchor light, two perpendicular lights at peak, and one light at each mast head, that on the *after* mast. *Red* if procurable.

Whistle signals used by mutual understanding between the steamers running regularly from Shanghai :—

One short whistle - -	"I port my helm."
Two short whistles - -	"I starboard my helm."
Three „ - -	"Come on, passage clear."

Rule of the Road.—Steam vessels going with the tide have the right of way, and show a square blue flag at the fore; those acknowledging the right, hoist a white pennant with a red ball.

Two steamers flying the blue flag are on no account to attempt to pass.

A square red flag at the fore, means, use great caution in passing—*Danger.*"

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DIRECTIONS.*—The entrance to the Pei ho river being subject to continual change, no specific or permanent directions for its navigation can be given, and the greatest caution is necessary. Local pilots are however always to be procured.

According to the latest information (September and November 1882). After passing the light-vessel at the entrance, as soon as the *red* entrance buoy is seen, it should be steered for, and left on the starboard hand, after which a N.N.W. ¾ W. course should be shaped (the two beacons on the North fort will then be slightly open) continue steering thus, until the two beacons on the South fort are in line, when turn in for the Elbow buoy (*black*), leave this on the port hand (but do not approach within 2 cables of it), and steer for the beacons, keeping them in line until near the inside *red* buoy, which round; and keep midway between the two forts. The numerous junks and sharp bends render the navigation difficult.†

The beacons, before described, have been erected for landmarks in case of the displacement of the buoys, and are used when the buoys are removed on the approach of winter and until the channel has been re-buoyed in the spring after the breaking up of the ice. The beacons are on the mud-flats below the forts.

In navigating the river, from Taku to Tientsin; owing to its winding course, great care is necessary; this also is subject to constant alteration. Steam vessels of nearly 12 feet draught, and 200 feet in length, have reached Tientsin at the period of spring tides almost without a check, but some of the bends are very sharp. The most difficult and shoalest portion of the passage is off the brick-kilns at a bend known as Double reach, about five miles below Tientsin, where many vessels have stuck fast, and on some occasions the cargoes have had to be discharged before the vessels could be floated. Lieut. G. Pollard remarks that by keeping along the opposite bank the deepest water will be found, and as a general rule that the same water will be found here as on the Taku bar at high water, ships therefore usually leave Tientsin so as to arrive at this reach at high water.‡ Conveniently placed warping posts are now erected at the worst places, so that check-lines can be made fast. Twin screw vessels do not require these aids.

* Lieut. and Com. R. Groome, of H.M.S. *Cockchafer* (1883), states, that the 2nd buoy must now be left 50 yards on the *port* hand when rounding it, as a spit has grown out to the westward. A spit has also extended eastward of 3rd buoy, to clear which, steer for S. cavalier on fort until the northernmost of the two south beacons is nearly touching the next fort, when steer for it, until past inner buoy. A steam tug is always in readiness at Taku to tow sailing vessels up the river. For directions to make the Pei ho from Sha-lui-tien island, *see* page 642.

† Abridged from the remarks of Navigating Lieut. F. J. Harwood, R.N., of H.M.S. *Swift*, 1882, and Lieut. G. W. Pollard, R.N., H.M.S. *Zephyr*, 1882.

‡ Lieut. Pollard, *Zephyr*, 1882.

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In the second reach below Tientsin the channel is *now* on the left bank. Tientsin reach is also very shoal, but a general mid-channel course, edging to the left bank a little above the bend, will give the best water.*

As in some parts of the river the channel is very narrow, and barely of sufficient width to allow two vessels to pass each other, it has become customary for that vessel which is proceeding against the tide to run her bow aground so as to make way for the other, which may be done anywhere without danger.†

Should it be necessary to anchor in the river during the night, a sharp look-out must be kept for junks as they generally drift down the river broadside on, and some of them are so large and massively built, and so high out of water, that they are liable to cause serious damage.

From the end of May to the beginning of September is the period when the greatest number of junks are met in the river. Those of Siam are the largest. In June 1869 the junks were moored five abreast on the north side of the stream and three abreast on the south side, so that the passage was exceedingly contracted. They are generally badly moored, and a slight collision is sometimes sufficient to break away a whole tier of them, in which case it is generally considered the more prudent course for a steam vessel, if possible, to push on at once, and so escape the delay as well as the block and confusion that invariably ensue.

The regular steam vessels running to Tientsin are moored alongside their respective wharves. In the earlier part of the year they can lie close to, but as the season advances the sandbanks in the river increase, and they are unable to do so, and men-of-war stationed there will find it necessary to shift berth further out from time to time.

According to a recent regulation foreign vessels are only allowed to remain at anchor at Ta-ku and at Tientsin ; they must there occupy berths assigned by the Custom House officials. Vessels anchoring on the route to Tientsin are required to anchor as close to the bank as possible, and to buoy their anchors. No foreign vessel is allowed to anchor in any narrow part of the river, nor in the bends. Persons infringing these regulations are liable to a fine.

Telegraph Cables.—Two telegraph cables have been laid in the under-mentioned positions at Ta-ku, Peiho river entrance :—

1. A cable connects the upper corner of Ta-ku South fort with the lower corner of the North fort.
2. A cable connects the China Merchants' Steam Navigation Company's landing pier with the North bank of the river, and is landed about 20 yards above the landing steps of the North fort.

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* Lieut. Pollard, *Zephyr*, 1882. † Ibid.

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It was intended (1880) to indicate the positions of the cables by beacons, but it is uncertain if this has been done.

Caution.—Mariners are cautioned not to anchor in the vicinity of these cables.

DURATION of ICE in Winter.—In 1860,* ice formed on the flats off the entrance of the Pei ho about the middle of November; from the 24th to the 27th, during a severe frost, the ice packed at the entrance of the river, which became almost impassable. Up the river, near Tientsin, the navigation was suspended on the 30th. A thaw set in, and the river was again perfectly free of ice on December 5th. On the 20th a hard frost again set in, the maximum temperature being 22° Fahr. On the 22nd the Chinese commenced carrying on traffic with sledges, from which time the ice gradually thickened to 20 inches which was its maximum.

The last communication with the forts was on the 22nd December, by the *Clown*, gunboat, but she was unable to return, and had to remain in the ice till the spring. H.M.S. gunboat *Watchful* held communication at 1½ miles off shore, landing two officers.

On the 1st of January, the *Furious* and *Renard* had to shift their anchorage 3 miles out to avoid the masses of ice. On the 23rd of January, the *Renard* passed through a field of ice 23 miles in extent, and half a foot thick, and anchored 15 miles S.E. of Taku. On the 3rd of February, the same vessel fell in with floating ice, 75 miles S.E. by E. of Taku and at the distance of 32 miles from that place, the ice appeared packed, and of 20 to 30 inches in thickness, and only to be traversed by charging with the vessel's stem. She coasted N.N.E. along its edge, which appeared a permanently fixed mass, and communicated with Sha-lui-tien island, along which detached masses of ice were being carried by the current. Inside the island the ice also appeared to be permanent.

Commander Goodenough considers Sha-lui-tien island by far the most convenient spot for landing the mails for Pe-king in the latter part of December, January, and February, as it may be approached within 100 yards, and the strength of the tides is too great ever to allow the ice to set fast at this point.

In 1866 the Pei ho was frozen up on the 15th December, but the general time is a few days earlier, in 1873 it was as late as 28th of January.† The ice breaks up as a rule about the 10th of March,‡ when it parts with a great rush, and in 48 hours has all disappeared during a continuous ebb tide; during its breaking up the ice is not sufficiently heavy to damage a vessel riding at anchor in the stream.§

* Commander Goodenough, R.N., H.M.S. *Renard*, 1860. *See* also foot note, page 638.

† Navigating officer, H.M.S. *Thistle*, 1873.

‡ In 1874, the ice broke on the 22nd January, the first steamer from Shanghai arriving on March 1st.—Remark Book Navigating Officer, H.M.S. *Elk*, 1874.

§ H. Vernon Russell, Esq., R.N., H.M.S. *Slaney*.

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The steamer *Appin* reported that on the 27th December 1875, the ice was quite firm at the Taku bar, as far out as the *red* buoy, and that fields of pack ice were encountered 20 miles out. Weather fine but very cold.

TAKU FORTS,* commanding the entrance of the Pei ho leading to the capital, are an important military post, and were deemed by the Chinese impregnable till they fell before the British squadron on the 20th May 1858, and were captured a second time by the British and French allied forces on the 21st August 1860. The land is so perfectly low and flat about them as to made it difficult for a stranger to detect the entrance of the river, and there is nothing to denote its position, except the shipping and the five elevated cavaliers of the two principal forts which, from their yellow colour, are sometimes discernible with difficulty.

Five forts command the entrance. The largest or South fort is on the right bank, and on its sea face, which runs N. by E., are three cavaliers on slight bastions, one at each extremity and one in the centre. The fort is built of yellow clay and straw; the cavaliers being constructed of driven elm piles lashed firmly together with coir cables, and covered with the above material. Its northern point abuts on the river; the southern is 500 yards distant. The mud flats fronting the fort are of the most treacherous character, and unfit for landing on when uncovered. There is a smaller fort in the rear to the south-west.

The outer or North fort on the left bank is so constructed as to rake the passage and enfilade the South fort. It has two cavaliers, and fronting it on the south-east is a good beach of sand and shells extending a mile or two and accessible to boats at high water, and the mud flat in front is less soft than on the other side.† The five cavaliers of the outer forts and the low pagoda-roofed temple of Tung-ku are conspicuous objects from the sea, the former being visible about 8 miles from the deck of a large ship. They are also sometimes thrown up by mirage. The stream is about 220 yards wide between the forts, and from thence it takes a south-easterly direction through the banks to seaward, for 4 miles.

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* The Chinese Government is said to be strengthening the forts both at Taku and the Canton river, and arming them with modern rifled ordnance of the heaviest description. —1883.

In 1881 a large fort was in course of erection north of North fort, the two being connected by a covered way. A large fort, or fortified camp was also seen at How-tsze-ku (near Sin-cheng) with guns so placed as to command the bends of the river. It was surrounded by a large moat and apparently capable of holding 10,000 troops. —Remark Book of Navigating Lieut. C. E. Prichard, H.M.S. *Fly*, 1881.

† The inner part of this bank was crossed on foot without difficulty, when uncovered from a position 1½ miles south-eastward of the North fort, up to the beach.

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About 3 miles north-west of the outer or North fort is Tang-ku on the left bank, and 2½ miles further in the same direction is Sin-ho, a mile off the river, from which there is a road leading to Tientsin, and another to Peh-tang, 6 miles distant. Tung-ku or Ta-ku village is 3 miles up the river on the right bank, at the second bend; its temple, close to the river side, is one of the few conspicuous objects from the sea; from this also is a road to Tientsin.

Telegraph cables.—*See* page 632.

Caution.—Mariners are cautioned not to anchor in the vicinity of these cables.

The officer in charge of the Imperial Maritime Customs at Taku receives the papers of all British sailing vessels bound either for the port or for Tientsin, and forwards them to the latter place, those of steamers being retained on board and delivered to the British consul on arrival at the city. The Chinese customs' establishment, pilots, &c. are situated about 2 miles above the forts.

Supplies.—Near the sea the banks of the Pei ho are flat and sterile, the inhabitants poor and squalid, and their habitations mean, dirty, and dilapidated; but higher up the whole country is beautifully cultivated. In some parts of its course the river is raised above the surrounding country.

At Tientsin and along the river ample supplies of bullocks, sheep, and poultry can be obtained. Sheep are cheap and plentiful, and fatten to a great size on oil cake. Vegetables are rather scarce. At Tung-ku, the village about 1½ miles above the forts at the entrance, a junk for watering the ship was filled, and the water after being allowed to settle proved to be very good. One junk load was about 70 or 80 tons, and the Chinese were glad to load her and bring her outside the river to H.M.S. *Pique* for a trifling sum. Water from the river, if taken sufficiently above the entrance or at low tide, and cleared by alum, which may be bought at any of the villages, is wholesome. Slack lime can also be procured.

TAKU to TIENTSIN.*—By the windings of the river the distance from the Taku forts to Tientsin is 49 miles and the distance by road from the village of Taku 30 miles. The whole country from Taku to 12 miles north of Peking is an uninterrupted plain of vegetable and fruit gardens, orchards, and fields of rice and other grain.

Koku is a large village, 16 miles above the forts, where a large number of junks are always found at anchor, much indeed to the hindrance of navigation in general and that of large steamers in particular. These junks are

* Abridged from "Treaty ports of China," page 466. *See* Admiralty charts of the Pei ho, Nos. 2,653 and 2,654, scale $m = 2{\cdot}4$ inches.

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sometimes moored in tiers, 12 abreast, and the utmost care on the part of masters or pilots of vessels cannot always avert collision, be the vessel ever so well handled.

Koku is the port at which all the southern junks from Amoy, Swatow, &c., discharge their cargoes, and as many as 150 large junks, chiefly laden with grain, and of great height and size, arrive almost simultaneously about the end of July and beginning of August, and do not leave much before the middle of October. Stringent regulations have been drawn up and published for the information of the foreign ship-masters and the navigators of Chinese junks, but the difficulties are not overcome, for the junks employed in this trade from their awkward build and great size, are very difficult to manage in a tideway, and collisions consequently are very frequent. In one year 40 arrived and went crowded in a body up to Tientsin, anchoring in all parts of the river and rendering navigation both difficult and dangerous.

Double Reach, about 5 miles below Tientsin, is the most difficult part of the river to navigate. Most vessels frequenting the port have, at one time or another, stuck fast in this awkward spot, and on more than one occasion have had to discharge cargo, in order to lighten sufficiently to get afloat. In the event of thus grounding, boats are despatched from Tientsin as quickly as possible. (*See* also p. 631.)

TIENTSIN or TIENTSING Treaty Port stands, as before mentioned, at the confluence of the Yu ho or Grand canal with the Pei ho. The latter, here called the Yun-liang ho, has run a course of 300 miles from the northward, the Yu ho a course of 220 miles from the westward. They meet east and west, their commingled waters flowing south and then south-east. Tientsin stands south-westward of the junction. The city proper is enclosed within a four-sided crenellated wall, nearly square and three miles in extent, with towers at the four angles. It is the official part. Towards the river, suburbs more extensive than the city itself extend towards and two miles down along both sides of the river. Here all the trade is carried on. There was in 1878 population of about 950,000.

The city is a focus of nuisances, of which the soap-boiling works are not the least, though perhaps not the most unhealthy. Cholera, typhus, and small pox, especially the last, are very prevalent, and carry off vast numbers of victims every year. Tientsin has a water communication in all respects equal to that of Shanghai or Canton.

The foreign settlement or concession is about 2 miles below the city. That of the British is at Tz-chu-lin on the south bank of the river, where is the consular establishment. It has a fine bund, where is a jetty at which steam vessels can lie and unload. About a quarter of a mile below the

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British concession is the residence of the Chinese Commissioner of Customs. Here also is a circular rampart and tidal ditch generally known as Sang-ko-lin-sin's Folly, within which are situate all the foreign settlements, Customs establishment, a small church, race course, burial ground, and the Elgin joss-house, a small temple where the treaty of 1858 was signed. The Imperial Government has two arsenals at Tientsin under the superintendence of foreigners. At the arsenal on the left bank of the river, gunpowder is manufactured on a large scale, as well as shot and shell for 38-ton Armstrong guns. Here, also, is a torpedo college presided over by an English electrician, where 14 students undergo a constant course of instruction. This college is connected both by telegraph and telephone with the viceroy's yamen at Tientsin; the work of the students.*

Trade.—The total trade of the port of Tientsin for the year 1881, amounted to 7,215,097*l.*, of which the imports were 6,452,057*l.* and the exports 763,040*l.*

During the same year the total number of vessels entered was 435, representing 260,337 tons; of these 216 were British, of 123,783 tons, in other words about one half.† The chief foreign articles of import are cotton goods, cambrics, woollens, silk, opium, metals, needles, and matches. The trade is by no means unimportant, but it is fast merging into the hands of native merchants, who avail themselves of every facility which is at the disposal of the foreigner, and procure their goods direct from Shanghai. The native imports are hemp, paper, teas, sugar, silk, sea-weed, bêche de mer, camphor, and ginger. The chief exports are cotton, soap, skins, felt. wool, grain, drugs, and fruits.

The native currency is confined to taels, copper cash, and a sort of bank, note current on the spot. Dollars pass at either Tientsin or Peking, but on the road copper cash are more useful. Tientsin cash are not current in Peking. The northern Chinese now accept small silver coins such as ten and five-cent. pieces and sixpences.

Coal.—Acting Consul T. L. Bullock, writing in 1881, states that coal mines have been opened at Kaiping, which, he remarks, "will doubtless "furnish all the coal required in Tientsin and its neighbourhood, and will "supply the steamers visiting the port." It is of good quality.‡ In addition to this the Pilot Association at Taku have always a good supply of Australian, Japanese, and Formosa coal on hand, which may be obtained by any of H.M. ships on reasonable terms.

Mails.—Couriers leave Tientsin with the overland mail at noon every Tuesday, Thursday, and Saturday, for Ching kiang. The average time by

* Navigating Lieut. H. Woolward, R.N., H.M.S. *Midge* 1878.

† From report of Acting British Consul T. L. Bullock, commercial reports of H.M. Consuls in China, 1881.

‡ Commercial reports of H.M. Consuls in China, 1881.

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this route taken for letters to arrive at Shanghai being 16 days (if not retarded by snowstorms). There is also a postal service to Newchwang; and a daily one to Peking.

Supplies.—*See* page 635. At Tientsin there is so much alluvial matter in the river water that it is even unfit for the purpose of washing decks, unless it first undergo some filtering process, or be cleared with alum, which precipitates the insoluble matter. Drinking water is supplied by the compradors.

Climate.—Off the river's mouth it has been found both agreeable and healthful during the summer months, the sea breezes which then prevail tempering the heat; at Tientsin the summer heat is intense, rising to 90° and at times to 105°, but it does not appear to be accompanied by those debilitating effects, which so often attend it in tropical latitudes, and the diseases, typhus, cholera and small pox, which are so rife, are rather attributable to want of sanitary precaution than to climatic influence. In winter the cold is excessive, the thermometer ranging from 25° to 5°, the most severe period occurring generally, early in February, when the temperature falls sometimes to 5° below zero. The ice generally breaks up in the early part of March, and the temperature rises to 65° before the end of the month.*

At Tientsin,† in July 1870 the maximum temperature was from 99° to 105°, minimum 72°; barometer 29·60 to 30·02; light winds equally from between North and East, and between S.E. and S.W.; one south gale force 10 to 11, bar. 29·30.

August. Bar. 29·98 to 30·10; therm. max. 97°, min. 69°; breezes prevailing between North and N.W., remainder East round south to west.

September. Bar. 29·98 to 30·38; therm. max. 90°, min. 65°; breezes moderate from South to N.W., chiefly S.W. with calms.

October. Bar. 30·00 to 30·80; max. 80°, min. 50°, winds half north-easterly, half S.W. to N.W.

November. Bar. 30·40 to 30·75; max. 57°, min. 35°; moderate breezes chiefly from North and West, very little from North and East, some S.W.

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* In 1880 (the mildest winter on record for some years) the last steamer that crossed the Taku bar was unable to proceed up the river; she arrived on January 6th. On the 26th of that month the river was entirely closed, and remained so until March 1st. The greatest thickness of ice recorded was 10 inches.—Lieutenant G. A. Grey, H.M.S. *Mosquito*, 1880.

† Navigating Lieut. C. H. Stewart Douglas, R.N., H.M.S. *Avon*.

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December. Bar. 30·20 to 30·70; max. 48°, min. 18°; light breezes from N.W., occasionally from S.W. Ice in November but river not frozen up till 26th December; small pox prevalent.

January 1871. Bar. 30·56 to 30·20; cold intense, average temp. 8°; gunboat housed in with stoves on the upper deck, therm. 30° to 15°; northerly winds prevailing.

February. Bar. 30·58 to 30·29; max. 40°, min. 26°; frequent dust storms. On the 27th the ice began to break up.

March. Bar. 30·40 to 30·48; max. 69°, min. 30°; dust storms nearly every day commencing about 10 a.m., with the wind from north-eastward, shifting about 2 p.m. to a nearly opposite quarter. March 5th the first steamer arrived.

April. Dust storms nearly every day, wind dying away at sunset. The river which becomes considerably reduced in volume during the winter now attains its ordinary depth.

Above Tientsin, during the months of May, June, July and August, the heat is quite tropical, but after the 1st September the nights become very cold.

TIENTSIN to PEKING.*—From the junction of the Wen ho, 2 miles above Tientsin, where the river is 150 yards wide, it continues pretty uniform in breadth as high as Tungchow, which is 90 miles above Teintsin by the river and 63 miles by road. The influence of the tide is felt from 7 to 15 miles above Tientsin according to the level of the river, and its rate in the upper part of the river is from 2 to 3 knots. Boats of shallow draught can ascend the whole way, but ships' boats drawing 2 feet have experienced considerable difficulty, for the river in some places was found only 15† inches deep, and they have had to be dragged over the shallows. There is a narrow tracking path along the banks, by which according to the number of trackers employed, and the strength of wind and current, a boat may ascend to Tungchow in from 3 to 5 days. Here all boats generally unload their passengers and cargoes, which are conveyed to the capital by a broad paved avenue 11 miles long. A canal, the Yun-liang ho, 12 miles in length, also connects the Pei ho at Tungchow with the capital, but it is only adapted for flat bottomed boats, for the locks are inclined planes of masonry up which they are hove by capstans.

The residences of the British and other foreign ambassadors are within the city of Peking (*i.e.* northern capital) which is situated in a sandy plain

* *See* Admiralty chart of the Pei ho, from Tientsin to Peking, No. 257, scale $m = 2\frac{1}{4}$ inches.

† There was observed no material change in the level of the river between 23rd Sept. and 7th Nov. 1860, but in 1881 Navigating Lieutenant Chas. E. Pritchard, of H.M.S. *Fly* reports that there was sufficient water for a steam launch drawing 3 feet the whole of the way up to Peking.

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about 13 miles north-west of the Pei ho at Tungchow, in 39° 54′ N., long. 116° 27′ E.

PEH-TANG HO.*—From the entrance of the Pei ho, a low impassable shore fronted by an extensive flat runs north 6 miles to the entrance of the river Peh-tang. There is firm ground covered with tombs a mile or two north of Ta-ku, and also south from Peh-tang, but the remaining part is a swamp, or low ground broken by numerous ditches, and nearer Peh-tang an arm of the sea stretches 4 to 5 miles inland, across which the road from Peh-tang to Sin-ho runs W.S.W. on a causeway, with wet ditches on both sides of it.

The river Peh-tang receives its name from the village on the south side, within its entrance. Two forts stand at the entrance, one on either side, the cavaliers of which are good marks† to seaward, there being one on the east, and two on the west fort. On the south side is a long strip of hard mud, which dries considerably sooner than the surrounding flats, and on which are two huts. From the north point a sandy tongue stretches to the south-east, but it is surrounded by soft slimy mud, with ridges of sand on it.

The Bar (situated about 5 miles below the forts), is marked by stakes at its outer and inner parts. It is entirely of mud, as are the banks on either hand, which form long spits on either side of the entrance, drying out 4½ miles at low tides, the outer part of the northern spit being of hard sand. There were never less than 2 feet, and never more than 13 feet on the bar in 1860.

TIDES.—It is high water, full and change, outside the Peh-tang bar at 3 h. 0 m. The greatest range of the tides was 11 feet at springs.‡ In July and August, the night tides were the higher, near the springs; and the day tides near the neaps. The highest tides always occurred on the second and third day after full or change.

DIRECTIONS.—The Peh-tang, though a smaller river than the Pei ho, has a deeper and more easy channel of approach. To pass the bar, approach its outer part from S.E. to avoid the tongue extending from the north banks, after passing which, steer N.W. ¾ N. for the left part of the south fort, till the water begins to deepen, when bear away gradually, till the course is N.W. by W. ½ W., the edges of the banks being then steep, and generally uncovered (particularly the south bank), or showing by a smooth or ripple. It is recommended to cross the bar at high water, and if the

* *See* Plan of the Peh-tang ho entrance, scale $m = 1{\cdot}5$ inches, on Admiralty chart, Litsinho to Ning-hai, No. 598.

† In 1860. The east fort mounts 11 guns; the west fort 17 guns.

‡ The observations were taken during a light westerly breeze in June.

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banks above the bar do not show, to wait a little inside before proceeding up the channel which is 1 to 1½ cables wide between the banks.

The anchorage off the Peh-tang is open only from S.E. to South. The depth is 4 fathoms at 10 miles off shore.

The COAST from the Peh-tang runs about N.E. 10 miles, and then East and E.S.E. for 40 miles. For 15 miles from the Peh-tang it is fronted by a mud bank extending out 1½ miles; to the eastward of which it cannot be approached by ships. The coast which lies inside or north of the Sha-lui-tien banks, for the next 30 miles eastward of Hai-ye-tse, has not been examined.

HAI-YE-TSE and CHIANG-HO.—The village of Hai-ye-tse, 19 miles from the Peh-tang, can only be reached from the south-westward, but it cannot be approached, even by boats, except at high tide, as it dries out 2 miles from the shore at low water. West 3½ miles from Hai-ye-tse is the village of Chiang-kau, at the entrance and on the left bank of a small creek, the Chiang ho, in which junks unload, and from which the village derives its name.

Both these villages are very poor, the country desolate in the extreme, barren and uncultivated; a desert of dry mud, sand and salt, with here and there a stunted shrub. The inhabitants have little or no subsistence but fish, and have to send 12 miles for drinking water. Small whirlwinds are frequent and raise the dust in clouds. Poor as both these villages are, they both pretend to batteries for their defence, which, however, are unarmed and insignificant. There are three other villages to the eastward, but they have never been approached by foreign vessels, as they lie inside the Sha-lui-tien banks.*

SHA-LUI-TIEN ISLAND and BANKS.—Sha-lu-tien island, distant 120 miles N.W. by W. of Teng-chau, and 30 miles E. ¾ S. of the outer anchorage off the Pei ho, stands at the south-east extreme of an extensive group or mass of sand-banks, the outer edge of which is about 20 miles in length in an E.S.E. direction, at a distance of 12 miles from the coast. These banks, some of which dry at low water, must be approached with caution, particularly in thick or foggy weather. The island is low, but it has a small joss house on it, which, standing alone and upon an elevated spot, is conspicuous. It is covered with long grass and, unlike the banks which are of dark river sand, is of bright sea sand. It may be approached to within ½ a mile on its south side.

There are passages between these banks, which small junks use, and shoals innumerable, over which nets are spread, but there appears to be no

* There is a harbour at the Chang-cha entrance (the 2nd creek eastward of Chiang-ho), but nothing is known as to the means of approach to it.

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open channel between them and the mainland; there is a junk passage in some part, available only at high water.

From the island the eastern edge of the banks runs to the north-eastward. The western edge is skirted by irregular off-lying patches, and has many openings, one of which, one mile in breadth runs in 2 miles eastward. The lead gives good warning off the south-west part of the banks, after shoaling to 8 fathoms, but not off the island, where it is steep-to in 13 fathoms. Good anchorage was found with smooth water in lat. 39° 2′ N. off their western end, with shelter from N.E. gales, to which the anchorage off the river is much exposed, and a vessel may be hauled up for the position, if desirable, when running for the Pei ho in an East or N.E. gale.

TIDES.—It is high water, full and change, off the western part of the Sha-lui-tien banks at 2h. 50m., and neaps rise 8 feet. Near the banks the flood takes a W.N.W. direction along their edge at the rate of 4¼ knots at springs, and the ebb to the S.E. at the rate of 3 knots; on their western side the flood sets to the northward, but its velocity is not so great.

A strong north-west wind drives the water out of the head of the gulf of Pe-chili, reducing the depth a little; but a southerly wind raises the level of the water.

DIRECTIONS.—Having entered the gulf of Pe-chili by the Chang-shan channel, Miau-tau group, the course and distance to the anchorage off the Pei ho is N.W. by W. ¾ W. 140 miles, with regular soundings of 12 and 14 fathoms, deepening to 15 fathoms for 15 miles after passing the meridian of Sha-lui-tien island, after which the depth gradully decreases. With a strong S.E. wind caution is necessary, lest the vessel be driven too near the Sha-lui-tien banks.

If desirous of sighting Sha-lui-tien island, a N.W. by W. ½ W. course must be steered, and passing it at 2 miles in 12 to 14 fathoms, a W. by N. course for 30 miles will lead to the Pei ho anchorage. After passing the island the water should not shoal for 22 miles, after which the depths will decrease gradually. On the flood, which is said to run from 3 to 4 knots at springs past the banks, the water may shoal sooner than expected, and any sudden change of depth shows a vessel to be set to the north by the indraught of the flood through the many channels through the banks.

Commander Goodenough, of H.M.S. *Renard*, 1860, observes, that if Sha-lui-tien island be not sighted and no meridian altitude is obtainable, it is extremely difficult to tell on what part of the coast the ship has arrived, when the soundings have decreased so much as to make it prudent to anchor. Should night or fog prevent the island from being seen, it would be better to steer direct for the Pei ho anchorage; but should the vessel be very near the island and the reckoning dubious, it would be

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necessary to proceed with great caution, for there are 13 fathoms water within 2 cables of some parts of the island, and not room therefore to haul off on its shoaling. In such a case, or if there is any reason to infer the vessel may be to the northward of her course, it would be prudent to steer S.W. (or even more southerly on the flood) for a few miles, so as to ensure passing well south of the banks, when a W. by N. or W.N.W. course (which latter is parallel to the bank,) may be kept till the soundings decrease to 8 fathoms, when the supposed position of the anchorage should be steered for. In approaching the coast, the soundings should always be reduced to low water level, by constructing a rough tide diagram for the day, according to the moon's age, and correcting them thereby, otherwise the depths are liable to be nearly 2 fathoms in error at high water springs.

To cross the Pei ho bar (page 626), weigh on the flood, which sets strong to the northward across the flats, allowing sufficient time to reach and pass over the bar before the tide begins to fall, if it be necessary to cross at the top of high water.

Commander Goodenough also mentions, as the result of many passages across the gulf of Pe-chili, that the *Renard* was invariably set to the southward, at the rate of 0·6 of a knot per hour. He therefore recommends that it is always best to make a direct course from the Miau-tau group to Sha-lui tien island, which, if it can be seen, can be approached without danger to a quarter of a mile at night. The observations of the *Pylades* in 1840, when anchored in 15 fathoms N.W. by W. of Kao-shan, Miau-tau group, corroborate this tendency of the tide to set a vessel to the southward, for the tide is there recorded to have been setting W. by N. (? flood), and S.E. (? ebb).

In making the passage from Ta-lien-whan to Sha-lui-tien in July, the *Actæon* made an exact landfall without being influenced by tide, but the *Cambrian*,* making the same passage in September 1860 from Ta-lien-whan, was set more than 20 miles to the northward, for it was ascertained that in the course of one tide (a five knot breeze blowing at the time) she had exceeded that amount, the flood setting north.† If this be the case, the directions given above for making Sha-lui-tien are of the more import, ance. It also seems to show that the *Cambrian's* course was affected by the flood setting into the gulf of Liau-tung, which is very strong round the Lauti-shan promontory, though not much felt away from the land.

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* Robert Gilpin, Master, R.N., H.M.S. *Cambrian*.

† The flood therefore would appear to split upon Sha-lui-tien island.

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GULF OF LIAU-TUNG; WEST COAST.

About 10 miles north-east from Sha-lui-tien island is the south-eastern point of the province of Chili, which defines the limits of the gulfs of Pe-chili and Liau-tung; from thence the coast bends to the N.E. by N. 70 miles to the Great Wall of China, to within a few miles of which it continues to be quite low.

The CHING HO,* the entrance to which is 16 miles N.E. by E. of Sha-lui-tien island, is some 50 miles in length, but apparently conveying a smaller flow of water from inland than the river Lau-mu to the northward. There are 4½ fathoms water at 2½ miles to the S.E., and 2 fathoms at one mile to the east of the entrance, (which is marked by beacons,) but the anchorage is exposed from N.E. round South to S.W.

The passage into the river is through a break in the extensive banks which here skirt the coast for many miles, and across a bar on which there are only 2½ feet at low water. Inside the bar there is good anchorage for a large number of small vessels. The river has two other entrances: one from the eastward through a creek which dries at half-tide; the other from the westward, which is nearly as deep as the main entrance. Mud flats, covered at high water, extend for some miles in all directions. A sandy beach stretches nearly 5 miles south-west of the main entrance, and to within 10 miles of Sha-lui-tien island. No good landing can be found in the river before arriving near the village of Ta-ching-ho, where large quantities of grain are landed and stored, and which stands on the left bank at about 5 miles within the entrance. Any vessel that can cross the bar will find sufficient water to enable her to reach the village. Junks ascend the river in considerable numbers, but apparently not farther than the village.

To the westward of the Ching ho is a mud flat, formed into an island by the main and western branches of that river. A few miles west of the western entrance, a ridge of sand, which is covered at high water springs, joins the Sha-lui-tien banks.

Tides.—It is high water, full and change, at the Ching ho entrance at 1h. 20m., and springs rise about 6½ feet.

The LAU-MU HO has its entrance 16 miles to the north-east of the Ching ho. There are 4 fathoms water at 1¾ miles S.S.E. of the entrance, and 2¾ fathoms at 1½ miles, but the anchorage is open from N.N.E. to S.S.W. At the entrance there is a narrow bar, with 3 feet over it at low water. Having passed the bar, 10 to 12 feet may be carried close to the west point, and 10 feet up to a village or rather a series of

* *See* Plan of Ching ho, on Admiralty chart, No. 598.

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storehouses, about a mile up the river on the right bank where any of the junks discharge; a breastwork affords defence at this spot. Some junks ascend higher, and there is said to be a fort to protect the upper anchorage.

Water.—A strong stream of fresh water runs from this river into the sea, discolouring it to some distance. A vessel might anchor off the bar, and pump in fresh water during the ebb, for though of a muddy colour, it rapidly settles, and is wholesome for drinking. The water in the river is exceedingly good.

Tides.—At the entrance of the Lau-mu ho it is high water, full and change, at 1h. 30m., and ordinary springs rise 5 feet.

Hsin-shai-kau, about 2 miles south-west of the Lau-mu, is a bar creek, into which junks sometimes run for shelter in bad weather. The adjoining country on either side of the creek is an extensive swamp, more or less covered by the tide. To the south-west, large plains of sand and hard mud exist for 6 or 8 miles inland, and present a desolate appearance. The shore has a sandy beach.

The mirage on this coast is very deceptive, giving an appearance of water to the dry sand, and distorting the objects on shore considerably, small huts sometimes appearing, when first seen, to be large forts.

From the entrance of the Lau-mu the coast runs 10 miles N.E. by N. to Sha-ti point, and about half a mile off it is a bank of sand, nearly dry at low water, forming a protection for junks, which enter at high tide through one of the breaks in it, and unload at low water.

Wherever the breaks in the sand exist, a sort of river seems to form, in which there may be 2 feet at low water; this sometimes extends inland for several miles, and occasionally joins the sea by a circuitous route some miles distant; the intermediate space of soft mud, covered with a thin layer of sand, dries at half tides.

At Sha-ti point the formation of the coast changes. This point is the southern extremity of a ridge of sand hills 30 or 40 feet high, extending to the N.N.E. in a straight line for 17 miles, as far as the Pu ho.*

The PU HO, which enters the sea through the sand hills, though shallow and of no great length, is made use of at high water by junks, which discharge their cargoes near a dilapidated fort mounting six or seven guns, besides having a parapet for gingals, on the north bank, about a mile within the entrance. The bar is nearly dry at low water. The rise and fall is about 6 feet.

* At about 1 mile South of Shati point is the northern extremity of a long narrow ridge of sand which extends southward, parallel to the shore, and about a mile distant from it for nearly 6 miles. This ridge nearly dries at low water.

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The anchorage off this river is open from N.N.E. to S.S.W. The depth of 4 fathoms cannot be carried nearer the river than 5 miles East of the entrance, and 2 fathoms at one mile S.E.

The Pu ho running from the westward, drains a flat of rather a swampy nature, and a southern branch of it originates in rather an extensive marsh or swamp behind the long ridge of sand hills to the southward.

The YANG HO and TAI CHO HO.—From the river Pu, the ridge of sand hills, 30 feet high, contiuues N.E. 8 miles, and one mile beyond their termination is the entrance of the river Yang, which is very shallow, and though a few junks pass a short distance up it at high water, the greater number discharge their cargo just within the entrance, whence it is carried into the interior in carts. The depth is 1 foot over the bar, (which is marked by 2 beacons) and the rise and fall 6 feet. The beach is composed of sand and mud.

The anchorage off the Yang is open from N.E. by E. to S.W. The water is shoal, the depth being 4½ fathoms at about 4 miles and 2 fathoms at about 1½ miles from the river's mouth.

The land adjoining the sea to the southward of the Yang is still unfertile, and apparently at high tides partially covered. The line of sand-hills along the beach is at the distance of 300 yards from the water's edge, and extends inwards in places about a mile. Near the Yang is a small earthern battery for four guns, with a musketry parapet, but without any huts or accommodation for troops.

The river Tai-cho enters the sea at about 2 miles north-eastward of the Yang and about 1¼ miles westward from Liu-sia-kwang. The Tai-cho is described as short, rising in the low hills at the back of the village of Liu-sia-kwang, and running first in a westerly direction, then south. It does not cross the great road to Peking. The bar at the river entrance has only 1½ feet on it at low water. Between the bar and Liu-sia-kwang the soundings are shoal.

Tides.—It is high water, full and change, at the entrance of the rivers Tai-cho and Yang at 0h. 15m.; and the rise is about 6 feet.

LIU-SIA-KWANG.—The anchorage off Liu-sia-kwang is open from N.E. by E. to S.W. The depth is 4½ fathoms at 2½ miles, and 2 fathoms at a quarter of a mile from the sandy beach.

The passage into the beach near Liu-sia-kwang, is between two sand banks, the one running out from Rocky point, the other from the mouth of the river Tai-cho. The depth in the passage is 2 fathoms at three-quarters of a mile, and 4½ fathoms at 2¼ miles from the shore; the beach is steep, and the landing good. Springs rise 6 feet.

Supplies.—The land about Liu-sia-kwang is cultivated from the water's edge to the foot of the mountains, which are 4 to 5 miles distant.

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Horses and bullocks are abundant. There are two wells of good water at the village near the beach.

SHALLOW BAY.—From Liu-sia-kwang the coast runs E.S.E. 1½ miles to Rocky point, between which and Creek point, 6 miles to the north-east, is shallow bay, about a mile deep, clear of rocks, and the shore sufficiently steep to allow large boats to land easily. The depth is 2 fathoms at half a mile, and 4½ fathoms at 2 miles off shore. A reef of rocks, which generally breaks, encircles Rocky point at half a mile distant.

CREEK POINT, called by the Chinese Tsing-fung tau, or Blue peak island, is a rocky head on a sandy beach, with a joss house on its summit. There are rocks off it. The passage into the creek on its west side is shoal, serpentine, and nearly dry at low water; small junks go in at high tide. The rise and fall is 6 feet.

The sandy bay to the eastward of Creek point and between it and Shoal point off Ning-hai, a distance of 8 miles, appears clear of rocks; the beach is steep, and the 5-fathoms line of soundings is about 2 miles off shore. A cultivated plain extends from the mountains (4 to 5 miles distant) almost to the water's edge; horses and cattle abound, and a large portion of the country is good pasture land.

NING-HAI is a walled city 2 miles from the sea, along the W. side of the Great Wall. The anchorage off it, near the extremity of the Wall, is open from N.E. (round southerly) to West. With the pagoda bearing N. by W. the depth is 4½ fathoms at 1½ miles, and 2 fathoms at a ¼ of a mile, from the beach; inside the latter depth the bottom is rocky and unsafe.*

Shoal.—A shoal with only 3 feet on it and steep-to, extends about a mile off Shoal point.

The land in the vicinity of the city is pasture and cultivated, and cattle and corn are abundant.

From Ning-hai runs (along the plain at the foot of the mountains) the great high road to Peking, along which a great traffic exists. From accounts gathered from the country people the distance is said to be 680 li, or 223 miles English, though according to the longitude of Peking as generally received (116° 32′ E.), the distance would not appear to be more than 150 miles. The road is described as being good, and fit for the passage of the country carts. As a rule it passes along the foot of the mountain ranges, though at times it runs over some hills of no great elevation. It does not lead through any woods or forests, though groves of trees exist in its vicinity in certain localities. The road is crossed at intervals by rivers, but there are none of any size; they are not bridged

* There is a small junk harbour 2½ miles south of the great wall available as a landing place for boats. The northern entrance is the best. Navigating Officer's Remark book, H.M.S. *Albatross*, 1883.

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over, but are forded, except after heavy rains, when they are crossed by means of ferry-boats.

Tides.—It is high water, full and change, at the anchorage off Ning-hai at 12h., and the rise is about 6 feet.

The GREAT WALL of CHINA abuts on the sea on the western shore of the gulf of Liau-tung, in lat. 39° 58′ N., long. 119° 51′ E. It originates at the edge of the beach, to which it descends in broad terraces and massive flights of steps, now much ruined, and having a masonry pier jutting out into the sea. The Wall rises generally from 20 to 30 feet, in sections similar to the walls of Chinese cities, and with a thickness of 15 to 25 feet. After running round and enclosing a portion of ground close to the sea side, thus converting it into a fort, it runs obliquely inward to the west, and at a distance of about 1½ miles from the beach embraces the city of Ning-hai; then striking over the highly cultivated plains at the foot of the mountains, it runs up one of the ridges, and apparently to a great extent along the higher portion of the chain, towers at regular intervals marking its course, after it has itself ceased to be visible. These mountains, about 2,000 feet high, approach to within about 4½ miles of the beach, and though to a certain extent covered with vegetation they are devoid of all cultivation; not so, however, the plain at their foot, which rises gradually from the sea shore to a height of about 450 feet up the sides of the hills.

This part of the country appears to enjoy considerable prosperity, and is in a high state of cultivation; wheat, millet, and maize are mainly grown, and it is dotted over with villages and trees.

North of the Great Wall the western coast of the gulf is mountainous. The ranges run in a E.N.E. direction far beyond the head of the gulf, and nearly parallel to those on the eastern shore, from which they are distant about 80 miles, and either can be seen in clear weather from the opposite side of the gulf. Although appearing at a distance as continuous ranges, many of them are distinct groups separated by extensive plains, whilst their marked and peculiar forms render them excellent, as they would soon become familiar, and useful landmarks when steering an offshore course, which would generally be the case when bound to Newchwang.

From the Great Wall the coast trends E.N.E. 6 miles to Temple head, and after bending north for 3 miles round the head, it continues in the former direction 26 miles to Sand point, round which it turns abruptly to the N.N.E. All this coast is low, along the edge of an undulating plain, 10 miles in breadth from the foot of the mountains, and broken by low headlands on the sea shore off which are reefs.

TEMPLE HEAD, 120 feet high, is bordered to the distance of 2 or 3 cables by reefs of small boulders. On its east and south sides are cliffs,

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and on its summit a temple. Needle rock, 40 feet high, lies one mile W.S.W. of it, with rocky ground between and skirting the head as far as the point two miles west of the head, where there is a small shrine on a sand hill. Uneven ground of 2 to 3 fathoms stretches off also one mile S.S.E. of the head, and as far as the 5 fathoms line. The open bay north-east of the head is shallow and rocky, and its shores are of sand drift, as is the coast between all the small headlands for 9 miles to the eastward.

These small headlands, of which there are three, lie from 5 to 9 miles north-eastward of Temple head. Off the first of them a reef extends $1\frac{3}{4}$ miles where there are 10 feet on the edge, deepening quickly to 3 fathoms, and only 4 feet at one mile off shore. Off the second headland, the ground is even outside the 4 fathoms line, but not near the shore; at the third point, under the east end of its cliffs, a small joss house stands on a lower sand hill. Some rocks lie under the cliffs. All these rocks along the coast appear to be granite boulders.

East $1\frac{1}{3}$ miles of the joss house, is the opening into a lagoon, which small junks enter, but which is nearly dry at low water. The entrance lies S.E. by E. of a small hill, 50 feet high, to the north-east of the joss house.

Off the ruined earth tower 5 miles farther east, sand-banks skirt the shore at a mile, and through their higher ridge are openings where a boat may pass through the surf; the beech is steep at high water. There are several small streams of water on this part of the coast, but not accessible on account of these banks.

Several towers are seen inland; they are on the great high road, which it is supposed they are intended to indicate when the country is covered with snow. Mount Fisher, a high double peak of 1,800 feet elevation, is 12 miles inshore, and at the south-eastern extremity of the high ranges, which stretch to the westward. Those along which the Great Wall runs recede directly to the north from the coast, and join the above. A very sharp peak of the same height as Mount Fisher rises 4 miles northward of that mountain, and a hill of 900 feet 10 miles to the eastward.

SAND POINT, elevated 10 feet above the sea, is the south-eastern corner of the sandy plain. It is very low, and there is a small shrine at its extremity. Westward of it $5\frac{1}{3}$ miles, is a large conspicuous white building, a little inshore amongst trees, and off the point where it stands is a large reef, the outer part of which is 6 cables from the shore, with only 6 feet water inside the reef. One and a half miles nearer Sand point is a small point with a rock close off it.

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CRUIZER SHALLOWS are an extensive series of banks of coarse sand stretching nearly 8 miles southward of Sand point. The main body of them lies from South 3 miles, to S.W. by S. 6 miles from the point with patches of only 4 and 6 feet on the central parts of these most dangerous shoals. They are formed of a series of ridges, one of which carries only 3 feet for several miles. Even in moderately fine weather, there will be usually seen a long line of breakers extending from the shore, caused by the tides which are very strong across the shallows, or by the swell.

South of the main bank is a swatchway, nearly 1½ miles wide, of 6 to 10 fathoms water. Outside this and parallel to the shore, are some narrow strips of sand, but their eastern and western limits are not well defined. Their shoalest parts are 4½ fathoms at 9 miles S.W. by S., and also South 8 miles, from Sand point; and between them is a patch of only 2½ fathoms.

There are only distant marks to clear these shallows, but when the weather is clear the vessel's position may be ascertained on passing by cross bearings of the peaks. The following bearings will lead clear, but very close to the shoal:—the southern shoulder of the Great Wall range, 700 feet high, bearing West, leads to the southward; the summit of Tau-hwa island (the most eastern land seen to the northward) N.E. by N. leads to the south-east; Double hill, 250 feet, bearing North, or Boulder hill, N. by W. leads to the eastward; and the conspicuous building North, or Mount Fisher N.W. ½ W. leads clear to the westward; none of these marks can be mistaken. But in hazy weather there is still a good guide in the lead, if it be remembered that sand on the arming is a sure indication of the proximity of the banks, which are very steep-to, and the cleaner the sand the nearer the banks. It is therefore recommended that strangers (although junks use the swatch) should pass entirely outside, and not nearer in than 9 or 13 fathoms, *mud*.

There is a passage inside the banks at 2 or 3 cables from Sand point having 4½ feet at low water, but in using it beware of a bank which has only 1 foot, lying 4 cables E.S.E. of the point, and which must be passed inside of.

Anchorage may be obtained all along the coast, with shelter from West to N.E. or E.N.E. by avoiding the points and standing in to a convenient depth, though as a general rule, not beyond the 5 fathoms line. By standing for the conspicuous building on a North course, a vessel may be anchored near the shore in 17 to 18 feet, S.W. of Sand point, at a mile from the reefs off the building, sheltered from the eastward by the Shallows.

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TIDES.—At 3 miles N.E. by E. of Sand point it is high water, full and change, at 4h. 50m.; springs rise 7 feet, neaps 4½ feet. The flood sets to the northward along the coast, the ebb to the south-eastward; the tide turns earlier near the shore than outside.

The COAST for 6 miles north-eastward of Sand point, to St. Ubes point, is very low and sandy, particularly under the three hills here seen upon the low shore which is fronted by a large flat partially covered by the tide, the resort of immense flocks of wild geese. These isolated hills are excellent marks to denote the vicinity of Sand point, which is seldom seen from the deck beyond 7 miles. They first make like islands appearing far off shore. Of these, Boulder hill, 300 feet high, is steep, and on its summit, is a remarkable pile of granite boulders having the appearance of a ruined tower. S. by E., one mile from it is a smooth round hill, Quarry hill, 180 feet high, so called from a large granite quarry on its southern side. Double hill, 3 miles northward of Boulder hill, is about 250 feet high, and as its name denotes has two summits, on the northern of which is a cluster of temples; a village lies underneath it.

A triangular spit, steep-to, fronts this sandy shore, and at its outer point, E.S.E., of Boulder hill, there is only 1 fathom at 1½ miles from the beach. A little south of this, a spit of 15 feet continues 1¼ miles farther out on a S.E. ¾ E. bearing of the same hill, and not improbably joins the Cruizer shallows.

A small tidal river from the north-west flows north of Quarry hill to the sea with branches passing to the south-east on each side of the hill, but the main stream bears north-eastward along the coast line for 3 miles, disemboguing at two places south-east of Double hill. It is only 50 feet broad at low water, and a foot or two deep. Fresh water could not be reached, for at high water the stream is salt, and at low tide, both entrances are closed to boats.

WARREN POINT is 12½ miles N.E. ¾ E. from Sand point, and 2 miles farther on is Strong island. These are the only two prominences on the coast, the character of which is still rather low. The bay north of Double hill is shoal, there being only 2 fathoms at a mile from the beach. Along its northern shore for 6 miles up to Warren point there are flat undulating brown hills 70 to 100 feet in height, and several low cliff points with rocks off them alternating with small valleys, with sandy beaches fronting these. Even soundings are carried along the coast.

There is a hill 170 feet high over Warren point, the north-eastern part of which is a bluff with a signal staff on it. The south-eastern point is low, where are some rocks, and a practicable landing place at low water.

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The village of Tiau-yu-tai is on the inner side, and there are many small villages scattered about. It is very shoal all round the point, and the ground is foul and rocky for 1½ miles off. There are two patches of 9 and 10 feet a mile off shore, on S.E. bearings of the hill and north point respectively, and 6 cables S.E. of the latter shoal a 12-feet patch, with irregular soundings of 2 to 4 fathoms about them all. Warren point should not therefore be approached within the 5 fathoms line, but if desiring to stand in shore towards the north of it, Mount Clarence in line with the north point of Strong Island, about N. by W., will lead clear and to the eastward of this foul ground. Eastward of Strong island the bottom is again found very even.

STRONG ISLAND* 200 feet high, when first seen resembles Turnabout island on the eastern coast of China. It is covered with scrub, is steep towards the sea, and very rocky all round. There is a temple on its east side under the summit, the point of the little bay a cable south of the temple being in lat. 40° 24′ 22″ N., and 49′ 30″ E. of the abutment. of the Great Wall on the sea. This island is narrow and 8 cables long, and 3 to 6 cables N.E. of its north point is a reef, the outer rock of which does not cover, and two inner ones show only at low water.

TA-KU-HO.—The large deep bay to the northward of Warren point dries out as far as Strong island, with the exception of the channel of the Ta-ku-ho, which winds through the mud flats from the south-west, and which is only accessible at low water from the south side of the island by a channel midway between Warren point and Strong island, having 7 to 9 feet at low water; to enter which, when the south point of the island bears E. by N., steer W. by S. and close the point on the north of Warren hill to a cable. The water then deepens to 12 feet, but decreases to 9 feet off the point, after passing which and a sand spit which marks the western side of the passage, the course up stream is N.W. one mile, to where the junks anchor. Very small junks can get up to the south-west head of the bay some distance farther.

The COAST from Strong island is quite low, and falls back, but continues its general north-east direction 5 miles to a hilly projection called South Ning-yuen point, 250 feet high; the mud dries a mile off the intervening coast, the approach to which has not been examined within a line joining Strong and Saddle islands. At 10 miles farther north-east, is North Ning-yuen point. The 6 miles of coast south-west of this point is marshy, and the shore is not approachable on account of the Ning-yuen

* The Chinese name of Strong island appears to be Keuh-hwa tau, which name transposed has been erroneously given to the group called Tau-hwa on the chart, which latter should be Peih-kia-shan.

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flats, which fill up the whole space between these points. The town of Ning-yuen is represented to be in this vicinity, but neither town nor river were seen from the neighbouring heights, nor does there appear to be any trade or communication by water.

There are several remarkable mountains and hills on the coast, two of which, Spur and Table mountains, are 20 miles inland. Spur mountain, about 2,000 feet in height, has a long shoulder to the east, at the end of which is the spur. Table mountain, 1,800 or 2,000 feet high, is, as its name denotes, a flat topped mountain with precipitous sides all round. The 900 feet hill inland of Sand point has irregular slopes and a lower range in front. The 800 feet hill has two summits divided by a deep cleft, and a long ridge toward the coast. The 400 feet range has four small conical summits of about equal height. Mount Clarence is a fine peak 1,390 feet in height, with a ridge of steep hills towards South Ning-yuen point. The highest on the ridge is a double peak, 800 feet high with a peculiar mark down the side of the western one; lower down is a very sharp peak, 500 feet high, with a square shoulder on its south side; and still lower is a small peak surmounted with a tower: deep valleys lie between all these hills. The high ranges north of Mount Clarence are confused and difficult to identify, but the Coronet, over North Ning-yuen point, is a steep, symmetrical mountain of 1,090 feet elevation, easy of recognition, having on its summit a tower between two shoulders.

SADDLE ISLAND.—A group of one large island, named Tau-hwa, and three smaller, lie off the Ning-yuen flats. The outer and southern is a small saddle-shaped island 120 feet high, steep on all sides except that a number of rocks project 3 cables from its southern point towards the coast. There is a passage with suspiciously uneven soundings of 3¾ to 6 fathoms, sand, between it and the small island of the same height lying 6 cables S.W. of Tau-hwa. This other small island has steep sides, and there is a 4 fathoms channel between it and Tau-hwa.

TAU-HWA ISLAND, or Peih-kia-shan, 3 miles in extent north-east and south-west, stands out prominently on this part of the coast, from which its outer part is distant 6 miles, but it looks much farther, as the lowness of the coast between the Ning-yuen points gives falsely the appearance of a deep bay. A valley divides the island, making it appear when first seen as two islands, the southern hills rising to 600 feet, and the highest of the northern over its east point, to 720 feet. Its southern face is bold, in some places precipitous, and may be passed closely, except at a spot 7 cables S.S.E. of a sandy beach, where a cast of 4 fathoms was obtained; its eastern side may not be approached within 1½ miles, where a crescent shaped ledge of rocks, on which some patches just dry at low water lies along the shore, its outer part 9 cables off. The east point of

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the island kept westward of S.W., or Saddle island kept open of it, clears in 6 fathoms, its outer part being very steep. There are 4 to 6 fathoms inside the reef.

On the inner side of Tau-hwa are some low projecting heads, its northern point, such an one, being only joined by a small neck of sand. N.E. of this point is Table island, 80 feet high, the channel between, of half a mile width, having only 7 to 9 feet water. Table island is flat, with cliffs on all sides. Off its north end is a rock, 60 feet high, which from the distance resembles a sail. These must not be approached within 1½ miles; the western shore of Tau-hwa cannot be approached at all, as it dries out a long way at low water.

The NING-YUEN FLATS would connect Tau-hwa with the main at low water, but for a channel 4 cables wide carrying from 4 to 6 feet, running close round the point of the flats which project to within a mile of the island. The flats are of sand and mud generally, about 1 to 3 feet above the level of low water springs. Some patches of rock stand on the flats, of which the Cat and the Kittens on their southern part are the largest; the former is a black rock always above water, the latter a small batch of rocks which cover, one mile South of the Cat.

ANCHORAGE.—Although not examined, shelter from N.E. winds would probably be obtained west or north-west of Saddle, south of the flats, in 5 to 3 fathoms; or even in the bay on the south side of Tau-hwa, off the valley. On approaching the latter it would be well to avoid the 4 fathoms east, sand, which was obtained 7 cables S.S.E. of the centre of the beach. Anchorage with shelter from S.W. may also be obtained in 4 to 5 fathoms to the north-east of this group.

ARMYTAGE REEF lies nearly 4½ miles N.E. ½ E. of the eastern point of Tau-hwa, and 3⅓ miles East of Sail rock. It is only one cable in extent, and nearly level with the water, with one or two rocks showing. Rising out of 6 fathoms, the lead gives no warning. To pass eastward of this dangerous reef, keep Saddle island its own breadth open of Tau-hwa east point, S.W. ¾ W.

Rock.—A sunken rock, on which are 3 feet at low water and which sometimes breaks, lies 1¾ miles N. by E. ¾ E. of the Armytage. In calm weather there are tide ripples about these rocks, from which it may be inferred the ground is rocky or uneven. The bottom is mud to the north-east, but sand and shells near the sunken rock, off which soundings of 2 fathoms extend a cable.

To pass inside the rocks (if from the southward), with the mark on for passing eastward of the reef, as soon as mount Coronet is open north of Sail rock haul in about N.N.E., not quite shutting Saddle in till mount Clarence is in line with Sail rock, W.N.W.; then steer North. This

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course is given because, although there appears to be a good channel, $1\frac{3}{4}$ miles broad, inside the Armytage, it has not been sounded, except where thus indicated.

ANCHORAGE with shelter from the S.W. may be obtained in 3 to 5 fathoms inside these rocks; also anywhere along the coast, to the northward in 3 to 6 fathoms, as it is comparatively bold and clear of danger.

HUNTER POINT is 8 miles to the northward of Tau-hwa. The 3 miles of coast between it and North Ning-yuen point has three low hills on it, and off the northern is a large reef. Immediately over Hunter point is a rugged, steep range 820 feet high, the summit of which is broken by a ravine, with a partially ruined tower on the outer part. North of this is a sandy bay fronting a plain, from which the coast runs eastward along a line of steep hills with some prominent peaks, (there is a low tower on the western one,) and terminates, 16 miles N.E. $\frac{3}{4}$ N. of Tau-hwa peak, in the small bluff of Hulutau, at the end of a narrow hilly promontory 2 miles in length. A few rocks border the coast which may be approached to half a mile in 3 or 4 fathoms, and except near the bluff, the depth of 5 fathoms is at the distance of 3 to 4 miles.

HULUTAU PROMONTORY, 10 miles E.N.E. of Hunter point, and $1\frac{1}{4}$ miles in length, is only connected with the line of steep hills by a short narrow neck. Its south-east extreme is a round headland or bluff, close off which is a high pinnacle rock. The bluff has 5 fathoms close to, which decreases again to $4\frac{1}{2}$ fathoms at a mile, which is about the distance a vessel should pass it, for off the east face of the promontory, at half a mile East of the bluff, is a small rock, 2 feet above high water, and a little north of the rock, a sandy spit, on the outer part of which is a sand patch. A reef also lies off the north side of the promontory.

KING-CHU BAY, formed between the north side of Hulutau promontory and a point of land $6\frac{1}{2}$ miles to the N.N.E., is divided into two parts by a low hilly point, on which is a conspicuous tower. The south-western part is extremely shallow, the mud drying out far from the Tower point to the promontory, with only 2 fathoms at the distance of $1\frac{1}{2}$ to 2 miles from low water line. The northern part of the bay is scarcely less so, there being only one fathom at low water at a mile off shore, and 2 fathoms at 2 miles.

In the northern part of the bay, between two small heads, is the entrance to a small river, the Lau ho, 3 or 4 feet above low water level. Between two small hills on the eastern side of its entrance is the thriving little town of Ta-kia-tsung, at the back of which, on a low flat hill, is the

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temple Yuen-shin miau. A rock lies one mile south-west of the town from which rocky ground extends one mile south-east. This is the only part of the coast to which large junks trade. It is the sea-port of King-chu fu, the capital of the province, about 20 miles distance to the northward, and situated on the Siau-ling ho, described on next page, about 10 miles from the north-west corner of the gulf into which that river falls. King-chu fu stands on the great highway road from New-chwang to Peking; it has a considerable trade in general goods.

No vessel of 18 feet draught can enter King-chu bay. The water shoals gradually, and junks find good shelter from all winds except South and S.E. at a mile or two off the town.

STRATA ISLAND lies off the north-eastern point of King-chu bay, a mile from the shore, but connected with it by a ridge of sand and shingle dry at low water. It is very narrow, and with its rocks is a mile in length, S. by E. and N. by W. There are four regular, round hills on it, the highest 253 feet, and the stratification is laid bare along their western face by the occurrence of land slips.

Rocks.—A half-tide rock and a sunken rock of 6 feet water, lie respectively one mile East and half a mile S.E. of the island. They are each at the extremity of foul ground, on which several rocks uncover.

HEAD OF GULF.—Gulf hill, 551 feet high, conspicuous, and 6 miles N.N.E. of Strata island, marks the head of the gulf. At 6 miles farther on the shore turns abruptly towards the east, and becomes so low that its high water line is not visible from a ship's deck. The hill ranges are seen continuing in the N.N.E. for 30 miles, and eastward of them is a vast plain, which bounds the head of the gulf. The mud dries 4 to 6 miles from the coast, and on it are long lines of weirs as far eastward as the Ta-ling ho. There are only 2 fathoms at 2 miles from low-water mark, and 3 fathoms at 4 miles distance.

Siau-ling ho.—This small river enters the gulf round some earth cliffs, 5 miles N.N.E. of Gulf hill, its narrow bed taking a southerly course through the mud flats, the entrance of the channel being 4 miles east of the hill. It is only navigable by boats, even small junks having to lie off its mouth to discharge. King-chu fu stands on this stream at 10 miles from its mouth.

Observation Rock, lying S.S.E. ¼ E. one mile from Gulf hill, was found by observation to be in lat. 40° 53′ 45″ N., long. 121° 9′ E., or 2′ 4·53″ E. of Strong island (measured by three chronometers and two meridian distances).

TIDES.—It is high water, full and change, near Observation rock at 5h. 30m.; springs rise 10 feet, neaps 7½ feet. The tides appear to run

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regularly up and down the west coast of the gulf, turning at high and low water. They are very weak at neaps; at springs they are strong off the headlands.

The TA-LING HO, the entrance of which, 22 miles east of Strata island, was only partially examined, is apparently an insignificant stream without sign of traffic. There are 6 feet at low water on its bar (in November), over which the river flows in a direction nearly East.

KAE-CHU BANKS.—From the bar of the Ta-ling ho sand-banks extend S.W. 8 miles, from which point towards the Liau ho, in an easterly direction for 17 miles, are the tails of a mass of dangerous shoals known as the Kae-chu banks. They are very irregular; some are dry, some covered, and there are passages of 3 and 4 fathoms amongst them.

H.M. Ships *Cruizer*, *Dove*, and *Slaney*, carried on a triangulation for 33 miles along the head of the gulf in November 1860, to long. 121° 54′ E., about 12 miles from the Liau ho bar, and H.M.S. *Actæon* sounded to 3 miles west of the bar, so that there is a gap of 7 miles in the delineation of the banks, at their most important (in regard to vessels making the Liau ho) and dangerous part; near also where the *Sylph* grounded on their southernmost part, according to the following account:—

The *Sylph*, opium trader, in November 1832, was obliged to anchor here at a great distance from the land, there being only 2½ fathoms water about 6 miles off, so flat in this part of the gulf. Not being able to communicate with the shore, which was fronted with ice, and having no shelter from strong north winds, the vessel proceeded from hence towards a reported anchorage off King-chu. The *Sylph*, after weighing off the eastern coast of Kae-chu fu, deepened the water gradually to 4, 5, and 6 fathoms, then grounded on a sand-bank in lat. 40° 34′ N., long. 121° 43′ E., above 24 miles from the land, and narrowly escaped being wrecked, the vessel striking hard for a considerable time, until the wind changed from the north-eastward to the southward, which raised the water in the gulf, and floated her clear of the shoal.*

GULF OF LIAU-TUNG; EAST COAST.

LIAU-TI-SHAN† PROMONTORY.—From the south-west extreme of this promontory (*see* page 602), a hilly and bold coast takes a

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* The floating of the *Sylph* was, there can be little doubt, due to the rise of the tide, which is 10 feet at springs, unless, which is not stated, she went on shore at high water, and could not float until the southerly winds brought a very high tide.

† Or Lau-tieh-shan, Old Iron hill. *See* Admiralty chart of the gulfs of Pe chili and Liau-tung, No. 1,256; scale, m = ½ of an inch.

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northerly direction for 14 miles, and on it are two bays, the southern of which, Pigeon bay, has anchorage in 4 fathoms, protected from all except westerly winds. Louisa bay, a similar anchorage 5 miles to the northward, is a shallow inlet, with a small island within the entrance, outside of which anchorage may be obtained in 6 fathoms, also well protected except from westerly winds.

REEF ISLAND, 400 feet in height, lying 4 miles off Louisa bay, has a reef extending 3 cables from its south extreme, also a rock which uncovers 4 feet at low water, half a mile W. by N. from its west point. The tide here runs strong, with eddies off the rock.

IRON ISLAND, the native name of which is Si-hau-shan or Sea hat, is 750 feet in height with a somewhat flat summit and surrounded by iron-bound cliffs. It lies 6 miles off the north-western part of the promontory forming the south side of Society bay, and although it has not been neared within 1½ miles on either side its appearance indicates a bold approach.

SOCIETY BAY is a deep indentation of the coast line on the north side of the Liau-ti-shan promontory. It is 26 miles across at entrance and 20 miles deep, its head branching into two arms, separated by a hilly promontory, the southern of which arms, Kinchau bay, is very shallow, and approaches within 1½ miles of Ta-lien whan. The northern arm is port Adams. Convenient anchorage may be found anywhere, and shelter under the groups of islands in the bay.*

The south shore of the bay from cape Collinson to Wedge head, a distance of 15 miles, is an indented coast under an irregular mountain tract. Wedge head, its most prominent point, lies northward of a detached range the coast along which is bold with the exception of a patch of rocks which uncovers at a quarter ebb, 7 cables off a point 4 miles south-west of the head.

Wedge head, the cliffs of which are along its northern face, should be given a good berth, as the coast on both its sides is skirted by reefs, and the bays on either side should be entirely avoided. In the western bay a rock awash lies 4 cables off the western part of the head: in the eastern, a large reef, of which several patches uncover and which is very steep-to, stretches east one mile from the head.

From Wedge head the coast trends easterly to the head of Kinchau bay, and appears clear of danger as near as it may be approached. Warren cliff, high and of a dark colour, and the smooth bare cliff a mile east of it, are conspicuous objects.

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* *See* Admiralty plan of port Adams, No. 2,833, scale, $m = 1$ inch.

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Kinchau Bay.—The small walled town of Kinchau* stands on the plain at the head of the bay, under mount Sampson, where the mud dries out a mile, the shore being only approachable near high water. On the north point of the bay, are two prominent peaks, the eastern of which, Osborn peak, 720 feet high, on the western part of a range of hills, has a stony summit; the other, Key peak, 590 feet high, is a steep isolated peak at the north point of Kinchau bay, overlooking the sea, and half a mile from its base is Fishbourne island, 290 feet high, a smooth, round hill with cliffs to seaward and a small rocky head on the north-west. Close to the north-west of Fishbourne island is the best approach to port Adams from the south; and inside of it there is a passage of 13 to 18 feet, 2 cables eastward of the islet off its south-east point. Kinchau bay is very shallow and the bottom of soft mud, with the exception of a 13-feet bank of fine sand one mile wide, and extending 4 miles in a southerly direction from Fishbourne island off its north point, and on which is a rocky patch of 10 feet, S. by W. ½ W. 2 miles from the western point of that island. This bank is really a continuation of the Long bank from port Adams.

Sullivan Bay.—North of Key peak is a shallow bay divided into two parts by Drury island, which is formed of a ridge of low hills. Both parts are very shallow, the northern, Sullivan bay, being the better of the two. Entry island, having two summits and bold cliffs towards the sea, lies off a hilly promontory which is the southern point of entrance to Port Adams.

Murchison and Milne Islands.—Murchison island, 210 feet high, in the south-west part of Society bay, 11 miles N.N.E. of cape Collinson, and Milne island, 180 feet high, 3 miles E.N.E. of Murchison, are the two largest of a group of islands and rocks, through which vessels are not recommended to pass. In appearance they are long, low, and undulating. The western outlying danger is an islet with a reef extending from it to the south, lying half a mile off the north-west side of Murchison; the eastern outlying danger is a rock 2 cables off the east point of Milne.

In the interior of the group, there is also an islet off the east end of Murchison, some rocks with reefs off them west of Milne, and a patch of 9 feet midway between the islands. All dangers, except the two outer, appear to lie within the 5 fathoms line, which is generally steep-to. There is also a bank of fine sand carrying about 4 fathoms, extending N.N.E. from Murchison, the shallowest part of which, 22 feet, is 5 miles from the

* "Gold District City." There is said to be gold in the vicinity. The principal gold-bearing district is east of the Py-li river, in long. 122° 42′ E.

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island in that direction. The bank decreases from one to half a mile in breadth and its edges are steep-to especially on the west. The best anchorage is on the south side of Murchison.

Ripon and Everest Islands.—From 9 to 7 fathoms may be carried for 11¼ miles N.E. by E. ½ E. of Milne island up to the west head of Ripon island. Ripon and also Everest island, lying eastward of it, are in appearance long, low, and undulating, the hills being from 100 to 250 feet high. There are several small islets and reefs about them, chiefly to the north-east, but the western parts of Ripon, with the exception of a fringe of reefs a cable broad are free of danger, the western and almost detached head of the island being so bold that it may be passed at a cable in 7 fathoms.

Dangers.—In the passage, 6 cables broad, between Ripon and Everest are two patches of 7 feet water with 12 feet between them; and a rock which uncovers at a quarter ebb lies E. by S. 8 cables from the south point of Ripon, with a 4 feet patch 2 cables inside it.

At three quarters of a mile North of the north point of Everest is a reef with an islet on it, named Sykes rock, and a dry rock on its north extreme. At a cable to the southward of this is a flat reef which uncovers at half tide, with a 3 fathoms passage between it and Everest.

Coffin Island, lying 2 miles north of the east point of Everest, is small, flat-topped, and 100 feet high, with a reef extending 2 cables from its west side; otherwise it is bold of approach.

Guide Rock, 20 feet high, lies 8 cables north-east of Everest; a reef extends 2 or 3 cables from its south side.

Flat Islet, 6 miles N.E. by N. of the west head of Ripon, is quite low with a cleft in the middle as seen from the westward. Its reefs do not seem to extend beyond a cable from the points.

Awash Reef.—About 1½ miles North of Flat island, and 2 miles West of Frazer island is a reef of flat rocks half a mile in extent E.N.E. and W.S.W., many parts of which are awash at half tide.

Frazer Island, N.E. 2 miles of Flat islet, is 100 feet high, and rather flat and rocky, with a small pagoda on it. It lies at the extremity of the dry banks which stretch off from the shore at the north entrance of port Adams and is connected with the shore by an elevated ridge of sand which covers at high water.

Long Bank, of fine sand, is a continuation, in a southerly direction for 12 miles, of the banks on the north side of port Adams. It has depths of 7 to 9 feet off the port and 12 to 13 feet at other parts, except north-west of Fishbourne island, where there is a break in it a mile wide carrying about 16 feet.

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At 3 miles N.N.W. of Frazer island is Cone head, 600 feet high, and westward of the head is a deep inlet which is connected with another farther westward called Tung-tzia-kau and also with Hulu Shan bay to the north-west. This inlet is nearly all dry, and the approach to it very shallow, but junks cross its flats at high water. A double topped islet 120 feet high lies off its entrance, and another islet of triangular outline 180 feet high is seen south-east of Cone head. Hoh peak, the summit of the large island which separates these inlets, has an elevation of about 900 feet. The south shore of this island is 5 miles in length and is generally bold except off Round and Ridge points, its south and south-west extremes, where the rocks extend 2½ cables.

PORT ADAMS is an inlet or arm of the sea, 18 miles in depth, navigable by a channel from 2 to 8 cables broad kept open by the scour of the tides which fill its basin, there being only two or three insignificant streams falling into it at its head. It can be entered at high water springs by vessels drawing 20 to 21* feet (September), and at low water by vessels drawing 12 or 13 feet. Strong winds influence the level, the range observed being about 2 feet.

Supplies.—There is neither town nor trade in this inlet, a few small junks with firewood only being seen. Villages, though small are numerous, the largest of which is near the upper part of the inlet on the south side. This side is very fertile and well cultivated, but the north side is barren along the steep slopes of a range of limestone hills. Lime can be procured. Fowls, eggs, geese, black grapes, and brinjals were brought readily for sale, also shrimps and prawns. Sheep were procured at 3 dollars a head, and numerous herds of cattle were seen from the hills. No streams accessible for water were discovered although the country is well watered. The great highway road from Newchwang to Korea passes near the head of port Adams.

TIDES.—It is high water, full and change, at Sulivan bay (Society bay) at 0 h. 15 m., and springs rise 8 feet; at Mary island (Port Adams) at 2 h. 0 m., and springs rise 10 feet ; neaps about 7 feet. At the head of the port, the tide is half an hour later than at Mary island.

DIRECTIONS.—To approach port Adams by the deepest channel, 16 feet at low water springs, if from the southward, pass a mile south of Ripon island, a good mark to clear the rocks off which being Osborn peak in line with or open south of the cliffs of Fishbourne island E. ¼ N. With this mark on, when Coffin island opens east of Everest island bearing North,

* Unless, as has been asserted on doubtful authority, the level of the gulf is much reduced by certain winds at a later period of the year.

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steer N.E. by E. ½ E., or keep the highest part of the range, 700 feet high, in line with the western summit of Drury island (the island in the bay northward of Osborn peak), which will cross the Long bank, in 16 to 18 feet at low water, at 6 cables N.W. of Fishbourne.

When the summit of Fishbourne bears South, steer for Entry island, passing with advantage close westward of it in 30 to 16 feet, but a greater depth than 16 feet cannot be relied on, for a patch of rock with that depth on appears to extend half a mile westward of Entry; this, however, is uncertain. If wishing to pass outside this patch, when a mile southward of Entry bring Osborn peak on with the nearest western point of Drury island about S.E. by S., and when the north point of Entry bears E. by S. this spit or patch will be passed, and a N.E. ¾ E. course may be steered up the channel for the Passage islands, then appearing as one small rounded islet in the middle of the channel; but if the tide be ebb, care must be taken when rounding Entry that the vessel is not saddled northward on to the Long bank (page 660).

If approaching the port from the westward, and wishing to enter by the deepest channel, pass northward and eastward of Coffin, because the ground between Coffin, Guide, and Sykes rocks has not been sounded over, and then steer to pass 5 or 6 cables east of Guide rock, hauling in E.S.E. for Key peak when Sykes rock opens southward of Guide, then proceed as before; but if a greater depth of water than 12 feet is not of consequence, steer directly on a course about East, for Entry island.

When steering up the inlet, pass 3 or 4 cables north-west of Upright rock, which marks the edge of a shoal rocky bank on the South shore, extending nearly from Entry island to 3 cables south of the outer Passage island, at which latter part it terminates in a small sand-bank which dries at low water.

Should a snug anchorage only be sought, it can be found between the Passage islands and Long island in a blind channel, to gain which pass 2 cables south of the Passage islands, or with Kwan-tung peak, 1,580 feet high, in line with the outer extremity of the rocks off the north point of Long island E. ¼ S., anchoring in 5 to 7 fathoms.

If proceeding up the inlet, when approaching the Passage islands, take care when a mile below them to open the north-eastern island just clear to the northward of the western, which will lead up in the best water, 13 feet at low water springs. The ground below these islands is rather rocky and uneven. Passing at 2 cables north-westward of the Passage islands steer for Channel bluff, 460 feet high, the north-west point of Mary island, keeping it on with whatever part of White House peak it may be then in line with, about N.E. ¾ E. After a run of a mile the depth will decrease 3 feet, and the course will touch upon the edge of the western bank of the

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channel, when steer about a point more to the eastward (or E.N.E. on the flood tide) hauling up again with the peak a very little open of the bluff, and steering to pass mid-way between Harold island on the east, and the island off Direction head on the west, above which the channel becomes only a quarter of a mile wide; from this the depths increase to 6 and 8 fathoms and the channel sweeps by a curve round the north and east sides of Mary island.

This channel can be kept very well by the lead; or, after passing the island off Direction head on a N.N.E. course, take care not to shut the Passage islands in behind it, but keep them just open till the northern point (a cliff) of Mary island bears E.S.E.; then steer for White House peak, bearing gradually away to the south-eastward on a mid-channel course. The banks extending 3 cables west and north of Mary island are very shoal and studded with rocks near the shore. The Tide Pole rock, of two square boulders placed vertically and 15 feet in height, marks the southern steep edge of the channel half a mile above Mary island.

Anchorage may now be obtained in 7 to 9 fathoms, or one mile higher up in 6 to 7 fathoms. The channel up to the head of the inlet is from 2 to 3 cables in breadth, carrying 5 fathoms for 1½ miles above the northern point of Mary island, 2½ fathoms at 6 miles above, and thence decreasing to one fathom at 8 miles above. The inlet north-west of Mary island is filled with a shallow mud flat having only a narrow channel for small junks.

PETERMANN POINT, the north-western point of Society bay, is the western extreme of the hilly ranges of an island which forms the west side of entrance of Tung-tzia-kau. The southern point of the island has high bold cliffs, and may be passed close to. On the west side of the island, at 4 cables north of Petermann point, a line of rocks extends 4 cables off the shore in the south part of Sandhill bay, the sand hills of of which covering the lower part of the hill slopes all along the bay, form a conspicuous landmark for identifying the locality of Hulu Shan bay from a considerable distance in the offing. South point, the northern extreme of Sandhill bay and the south point of Hulu Shan, will be recognized by its smooth round hill.

Tung-tzia-kau, the entrance to which is between Ridge and Petermann points at the north-west part of Society bay, is very shoal, and open to south and S.W. Small craft enter in, also lorchas from Siam, with which country there is a small trade. The mud flats dry out as far as the two reefs northward of Ridge point, the eastern and higher reef marking the east side of entrance of a small channel which for one mile carries 12 feet water. There are 6 feet on the bar at its entrance at low water. The junks cross the flats at half tide.

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HULU SHAN BAY, first visited by H.M. ships *Discovery* and *Alceste*, August 16th, 1793, affords anchorage in depths under 9 fathoms, good holding ground of sand and clay, inside its entrance points, which are 5¾ miles apart, with excellent shelter from all except westerly winds, to which the bay is entirely exposed. Small vessels can find shelter from N.W. on the north side of the bay, or from S.S.W. on the south side.*

This bay is formed between the two islands which separate it on the south and east from Tung-tzia-kau, and the larger island of Ching-hang which separates it on the north from Fu-chu bay, to both which places there are shallow water communications from the head of the bay, by passing south of Calabash, a low, projecting head, the south extreme of Ching-hang, close to which and outside it is a bar with only 6 feet on it at low water springs. The channel for 5 miles above Calabash point carries from 9 to 24 feet water.

The land on the northern part of the bay is high and may be seen at the distance of 24 to 27 miles. North point, the south-west extreme of Ching-hang, and part of the western face of that island, have an abrupt cliff not visible till approached within 10 or 12 miles, after which if seen on a N.N.E. bearing, a low point, Reef point, will be observed showing to the left and beyond it. The land rises irregularly from the sea to an elevation of 1,030 feet behind North peak, which descends steeply on the east to a plain, these hills when first seen having the appearance of an island.

Supplies.—There is a village on the plain under the red hill north of Calabash point, but the villagers are very poor, and can afford no supplies. On the opposite shore, east of Middle head, a troop of ponies was seen grazing in the valley. The *Discovery* obtained water easily from the second stony beach to the eastward of North point, but the *Alceste* filled water farther to the eastward where there was a better stream (close to Observation spot on the chart), but not so easily reached except at high water, because of a reef 50 yards broad and steep-to which skirts the shore. When visited by H.M. gunboat *Slaney*, 17th June 1860, after a very dry season, there was no water at the lower part of the bed of the stream, but the water percolated through the beach and cliffs for 2 or 3 cables.

TIDES.—It is high water, full and change, in Hulu Shan bay at 2h. 30m.; springs rise about 8 feet, neaps 6 feet.

REEF POINT is the low termination of a small hill 240 feet high 1½ miles north of North point. The rocks off it are steep-to. From thence the coast falls back a mile and then continues for 4½ miles to the N.E. to

* *See* Plan of Hulu Shan bay; scale, *m* = 1 inch., on Admiralty Plan of port Adams, No. 2,833.

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Slaney head, the south point of Fu-chu, another large bay. At half a mile from Reef point and the same distance from the shore is the commencement of a rocky bank a mile in length lying parallel to the coast, and carrying from 7 to 12 feet with 5 to 7 fathoms inside it.

SLANEY HEAD, 420 feet high, is a round headland with abrupt cliffs, forming the south point of entrance to Fu-chu bay. A reef runs from it half a mile to the N.E. From this the shore is bordered by shoal, rocky ground with some patches of dry rock up to Table point, 7 miles E.N.E. of the head, the south point of inner entrance up to Fu-chu. Irregular ground of 9 to 11 fathoms stretches 8 miles N. by W. of Slaney head.

RUSSELL ROCK, 20 feet high, lies nearly in the fairway of the bay after rounding Slaney head, from which it bears N.E. by E. ½ E. 3 miles. It may be passed to the northward in 9 fathoms at 3 cables; at the same distance E.S.E. of it there are 4 fathoms.

FORT HEAD.—The land to the northward of Fu-chu is of singular formation and bears such a resemblance to extensive fortifications that at first sight there is a difficulty in believing they are not so. The westernmost hill, 530 feet high, having this appearance is the largest, and has a small conical projection above its regular surface; two others with flat summit are near this to the south-east, and they all have a remarkable appearance from north to south.

The hilly tract on which rise these remarkable elevations, has the appearance of a long peninsula, the western point of which is Fort head, a low table land separated from the foot of the hills by a plain. The Cocked Hat, an islet 60 feet high, lies 4 cables off it.

FU-CHU POINT, the north point of Fu-chu bay, is 4 miles S. by W. of Fort head, and between them is a shallow bay which has not been sounded. This is also low table land, 100 feet high, and extending from it one mile to the westward is a reef, the outer part of which, named Ragged rocks, dries; there are 5 fathoms at 2 cables outside them.

FU-CHU BAY is 11 miles across between Slaney head and Fu-chu point. The approach has from 15 fathoms at 12 miles, to 5 fathoms at 3 to 5 miles from the head of the bay, the soundings generally regular with mud bottom, except off Slaney head as above described.

The passage up to Fu-chu, at the head of the bay, is between Square island, a flat top isle 110 feet in height, on the north, and Table point, a projecting rocky head, on the south. These are 2½ miles apart, and there are 2¾ and 3 fathoms between, the deeper water being nearer the point

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than the islet. At one mile farther in and east of Table point, is a bar of 6 to 7 feet water half a mile in extent.

A tongue of shallower water extends about 4 miles seaward from the bar into the centre of the bay, with depths 3 to 6 feet less than on either side it. The best anchorage in 5 fathoms is south of this, with the west extreme of Table point bearing South, and the point next east of it E. by S. to E.S.E.; or in shoaler water by standing in East from this position.

To proceed up to Fu-chu, pass Table point at half a mile, steering E. ½ S., which course for 2¼ miles will lead up to abreast an islet; after rounding the north point of this islet at 2 cables' distance, steer S.S.E. ¾ E. about 2 miles, keeping 2 to 3 cables from the western shore, but closing that shore as the town is approached.

The small town of Fu-chu* commands but little trade. It produces coal, a sample of which, as also one of a manufactured article of combustion, were procured by H.M.S. *Bittern*, August 1855, and both found to be of little worth.

GLACIS POINT.—From Fort head the coast trends N.E. 5 miles to Glacis point, the termination of the gentle slope from a hill 560 feet high. The sand hills on the intervening shore are very conspicuous from seaward. At the back is a double topped hill, 1,020 feet high, the southern summit of which, Proboscis peak, is curiously shaped.

SCHOONER ROCK and COAST.—From Glacis point the land has a more easterly trend, sweeping round a large open bay. The shores are rather low, but broken by hill ranges, off the points of which are reefs. Schooner rock is a most conspicuous object on this part of the coast. It lies off a small hill 7⅓ miles from Glacis point, and resembles a fore-and-aft schooner with gaff-topsails set. In the first bay east of Glacis point is a reef a mile in extent parallel to the shore, from which it is distant 6 cables. The soundings in the southern part of this bay at 4 or 5 miles from the coast are irregular, the depths being 6 to 8 fathoms, with shallower ground of 4 fathoms 1 to 2 miles N.N.E. of Glacis point.

At 5 miles north-east of Schooner rock are the low McGowan cliffs, and the same distance farther on is Maxwell point, the western extreme of a hilly promontory 4 miles in extent, rising from the extensive plains of this part of the coast in varying heights to 970 feet, whilst 12 or 13 miles inland a precipitous mountain chain of 2,000 to 3,000 feet elevation extends

* The Rev. Alexander Williamson, who visited Fu-chu in 1868, places the city on the great road, in lat. 39° 50′ N., long. 121° 38′ E., which is about 14 miles N.E. by N. of the town above described.

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parallel to the coast for 30 miles. At 6 miles north-east of Maxwell point is Sandy head, a hill 440 feet high, the slopes of which are covered with sand, its colour making it very conspicuous from the outside of Bittern shallows.

VANSITTART SADDLE, 21 miles north-east of Schooner rock and 13 from Maxwell point, is a group of hills on a projecting angle of a great plain. The two southern hills on it, 160 feet high, make like a saddle, and in the distance like an island. A large square tower stands a mile to the eastward of them.*

Shallow rocky ground extends a mile off the Saddle; and there are two rocky banks, one at 1½ miles N.W. by W., and the other 3⅓ miles N. ½ W. of the Saddle. The former bank, half a mile in extent, has only 3 feet on its shoalest part; the latter, of the same extent, has 10 feet.

BITERN SHALLOWS are a collection of banks of coarse sand 22 miles in extent, fronting the coast, and marked by heavy breakers in north-west and west winds. Their most projecting point is 9 miles N.W. ¼ W. of Sandy head, where the most dangerous cluster lies. These outer banks carry 12 to 16 feet water, several of the inner from 1 to 10 feet, and others 15 feet. There are for the most part channels between them, having irregular depths, varying from 5 to 10 fathoms in the outer channels and 3 to 6 fathoms in the inner, with muddy bottom.

The lead will be the best guide to avoid these banks. Their most projecting point with 2 fathoms on it has 13 and 14 fathoms close to, whilst the sea outside has an uniform depth of 12 fathoms, mud; in other parts the banks are safe to approach to 10 fathoms, mud. A very conspicuous mountain 2,880 feet high in line with the small cliffs east of Vansittart Saddle, S.E., will lead over the north tails of the banks in 4½ to 5 fathoms.

TOWER HILL, 9½ miles N.E. by N. from Vansittart Saddle, has on its summit, 420 feet high, a conspicuous tower, and a higher hill rises at its back. There is an islet off this point, and N.E. 2 miles from it some rocky ground extending from the shore, where may be seen some large reefs. The tail of this ground in 3 fathoms is North of the islet.

KAE-CHU POINT is lower with a ruined tower on it, but the hills in its rear rise 700 feet and upwards over the plain which lies at the head of Kae-chu bay. One of these hills is a sharp cone 850 feet high. off Kae-chu point is a bank 5 miles in length N.E. and S.W., and on its outer point are patches of 10 and 12 feet. Tower hill S. by E. leads to the westward of these patches, and Kae-chu point East, leads to the north-

* From the westward Vansittart Saddle makes like an island with three saddles. —Remark Book of Mr. John Palmer, R.N., H.M.S. *Barrosa*.

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ward. A sandy bottom also indicates their proximity, there being soft mud in the fairway.

KAE-CHU FU, said to be in lat. 40° 30′ N., long. 122° 25′ E., and 10 miles inland, is surrounded by a high wall, but its houses are low and ill-built. It is thickly inhabited, and has an extensive trade. Many junks are usually seen at anchor northward of Kae-chu point at about 3 miles off shore, the approach to Kae-chu fu being very shallow, and by a small stream, the entrance of which, at low water, is 3 miles N.N.E. of Kae-chu point. This city, which is on the great road, has a considerable trade.

The Kae-chu Banks are described on page 657.

Tides are described at page 673.

DIRECTIONS for LIAU-TUNG GULF.—Chinese junksmen state that islands and shoal water exist in the upper and central parts of the gulf of Liau-tung, and that the large trading junks bound from Newchwang and neighbouring ports to the Pei ho keep the eastern shore of the gulf down to Hulu-shan bay, or even farther south, before they steer across to the westward.*

H.M.S. *Bittern*, when proceeding down the gulf from her anchorage off the Liau ho, kept a greater offing than recommended and carried regular soundings down south as far as Fu-chau bay. The pilots stated there were other shoals to the westward of the Bittern Shallows.

Lieut. C. E. Pritchard, Navigating Officer of H.M.S. *Fly* (writing in 1881), who has had considerable experience of the gulf, disbelieves in the existence of any of these shoals.†‡

Westward of Fu-chau and Hulu-shan bays there are some indications of shoals over an extent of 25 miles. There is a patch of 9 fathoms 10 miles W.N.W. of Fu-chau bay, and a second patch of 9 fathoms 16 miles W. ½ N. of the same; also at 15 miles W. by S. of Hulu-shan bay is a shoal of 6 to 7 fathoms, 2 miles in extent. Around all these shoals are soundings of 12 to 17 fathoms. Until further examined it would be prudent to avoid the vicinity of them at night or in bad weather, and take the following route:—Round Iron Island (page 658), off the north-western

* Navigating Sub.-Lieut. Thorburn believes the central part of the gulf to be free from shoals. Sailing up the gulf, a strong westerly set was experienced on the flood tide, but no easterly set on the ebb. The *Sheldrake* crossed from lat. 40° 23′ N., and long. 121° E., to the Newchwang light-vessel on an E. by N. course. A large number of junks were also following this track.—Remark Book, H.M.S. *Sheldrake*, 1882.

† Remark Book of H.M.S. *Fly*, 1881.

‡ The central part of the gulf is very imperfectly sounded, but such soundings as have been taken show no indication of any banks westward of Bittern Shallows. Neither the *Actæon*, *Dove*, nor *Leven*, which crossed the gulf from Vansittart Saddle towards Hulu-tau head, Tau-wha island, and the Great Wall respectively, fell in with any of these central shoals.

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part of the Liau-ti-shan promontory, at about 4 miles, and thence steer N.N.E. so as to pass 4 miles westward of North point of Hulu-shan bay, from which position a N.E. ¾ N. course will lead 3 miles outside the Bittern Shallows, and direct for the light-vessel off the entrance of the Liau ho. It should be borne in mind that when passing the Shallows the bottom should be mud (for these banks are of sand), and the depth never less than 12 fathoms. In general the junks will be seen sailing in the fairway in large numbers when approaching the Liau ho.

In steering up the gulf at the necessary distance of 12 or 13 miles from the shore, in order to clear the Bittern Shallows, some have found difficulty in making out the coast. In clear weather the high mountain ranges of 2,090 to 3,000 feet elevation, which lie eastward of the Shallows and which may be readily recognised, will be found good landmarks, and should it be suspected by the bearing of these, together with the depth of water, that the vessel is too far to the westward, it would be well when the mountain bore W.S.W. to steer in somewhat towards the land so as to make Tower hill and Sharp cone, the two best marks for ascertaining the position, by the bearings of which the light vessel could be made with certainty being N.W. ⅔ W. of the latter. But in thick weather if the position, when near the head of the gulf be not known, it will be prudent to anchor immediately the soundings decrease to 6 or 5 fathoms, bearing in mind that the difference between high and low water springs is 2 fathoms, and that a correction should therefore be applied according to the state of the tide.

THE LIAU HO or NEWCHWANG RIVER.

The LIAU HO.—The river Liau, at the mouth of which lies the treaty port of Newchwang (Yingtze), now open to foreign commerce, drains an enormous area of country consisting of the western half of the province of Shing-king or Liau-tung. It flows through a plain 70 miles in breadth and elevated only a few feet above the sea, and about its entrance the lowland, covered with trees, is not visible at the distance of 7 or 8 miles from a ship's deck, although it may be seen from the masthead. Vessels of 17 feet draught can cross the bar during the summer months, but after the 1st October, in consequence of the prevalence of northerly winds which lower the water level of the gulf, it is recommended that vessels abstain from loading over 15 feet.*

* A new survey of the bar was made in 1868 by the Officers of the U.S. corvette *Wachusett*, in which year the river was only navigable by vessels drawing 15 feet. The present directions are compiled from various sources.

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Ice.—The river is usually frozen up during four months and a half, or from the end of November to the middle of April, but the periods are irregular; the only means of communication is then overland, by couriers *viâ* Peking at uncertain dates. In 1865 an endeavour was made to run the mails to Point Arthur which failed. In 1880, the first ice formed on the 25th November, breaking up on the 12th of the following March, the first steamer arriving on the 17th of that month.

Vessels obliged to remain late in the season should moor close to the north shore, as the ice there is weaker, and generally later in forming; but if wintering at Newchwang, it is advisable to dock. No vessel (not compelled) should remain later than the 20th of November.*

The Liau ho rises in Mongolia, and after an easterly course of about 400 miles, turns towards the sea for a further distance of 250 miles. The tide affects the stream for many miles. Small junks ascend to Tie-ling 205 miles from the sea, and good sized junks to Tien-chwang-tai 30 miles from the bar. It is 150 years since large junks went up to Newchwang.

NEWCHWANG LIGHT is exhibited from a light-vessel moored off the entrance of the river in 5 fathoms water at 10 miles from the entrance points, and 3½ miles outside the bar. It is a *fixed* white light, elevated 40 feet above the sea, and in clear weather should be seen from a distance of 11 miles. The illuminating apparatus is catoptric. The light-vessel is painted red, with *Newchwang* in large letters on each side, has three masts, and one ball on her mainmast only.†

A gun will be fired when vessels are seen running into danger, and the course to be steered signalled by the Commercial Code. In thick or foggy weather blasts from a fog horn are sounded every 10 seconds, which can be heard 8 miles in a calm. When necessary to lower the light for trimming, a small white light will be hoisted, and a blue light burned. This light-vessel is only in position from about the 1st April to the 15th November on account of the ice, and her position ordinarily is, Tower hill S. by E. ½ E. 16 miles, Ruined tower on Kae-chu point S.E. ½ E., direction into the river about N.E. by E.

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* Derived from the remarks of C. Jeffery, Navigating Officer H.M.S. *Mosquito*, 1880. On the 24th November 1880, H.M.S. *Mosquito*, proceeded to the entrance of the dock, but finding only 9 feet of water over the sill (she drawing 10 feet,) returned to her winter anchorage on the north shore. During the evening a strong breeze set in from the north-eastward, the thermometer falling to 15° (F). Ice beginning to form at 2 a.m. of the 25th. By 1.30 p.m. of that day communication with the south shore was rendered impassible, and by 2 a.m. of the 26th, the ship was embedded, broadside to tide. —*Ibid.*

† If the light-vessel be driven from her moorings, a fixed *red* light will be shown at each end of the vessel in place of the usual white light. The ball will be struck, and until struck will be surmounted by a *red* flag.

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As soon as the last vessel leaves the port, the light-vessel is taken into harbour for the winter, and is re-moored in her station on the breaking up of the ice.*

BUOYS and BEACONS.†—There are three iron buoys‡ to mark the channel over the bar, also five beacons to mark the passage into the river. These buoys can be seen from the light vessel, the Entrance buoy with the naked eye, the Inner buoy with a telescope.

Entrance or Outer Buoy is a *black* conical buoy, surmounted by a black fustrum cage, visible 4 miles ; it is in 3 fathoms, ooze, on the south-western extremity of west bank, and outer edge of the bar. From it; the light vessel bears S. 64° W., distant 3½ miles, and Inner buoy N. 71° E. 2¾ miles.

Middle Ground Buoy, is a *red* nun buoy surmounted by a black spherical cage. It is moored in 6 feet water on the western edge of Middle ground shoal. From it the light vessel bears S. 76° W., distant 4½ miles.

Inner Buoy is a black conical buoy, surmounted by a black diamond shaped cage, visible 3 miles; it is in 10 feet, hard sand, on the inner edge of the bar, close to the S.E. edge of west bank, and about 2¾ miles N.E. by E. ½ E. from Outer buoy. It must be left to the westward on passing.§

Fishing Stakes at Deep Hole.—During the winter months the Liau river is closed by ice. While the navigation is open the fishermen have three sets of stakes off Deep Hole ; one set on the western side, and two on the eastern, all situated below beacon No. V. As these have proved good marks for the fairway channel, it has become customary, on their removal previous to the setting of the ice, to leave the outer stake of each set standing. The outer stakes are usually marked with cages or baskets.

East Spit or No. V. Beacon is a spar surmounted with two balls, it is painted *red.* This beacon, marks the western edge of the east spit (a shoal that projects to the S.W. of the dry bank, and is exposed at ¾ ebb), on the starboard side of the channel bank, and with the Inner buoy forms one of the leading marks in going out or coming in. The

* According to Lieut. Jackson, of H.M.S. *Sheldrake*, this light-vessel is taken to Chifu for the winter months.

† A middle bank has grown out about 1 cable west of No. 3 beacon, least water 8 feet. This beacon should be passed at about half a cable. Remark Book, H.M.S. *Zephyr*, 1883.

‡ During winter, and before the ice forms, spar buoys are substituted.

§ The pilots often place a spar buoy near the position where a beacon is shown on the Admiralty Charts, this is a most useful guide when in position, as it indicates the turning point.—Remark Book, H.M.S. *Fly*, 1881.

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Whales back shoal (on the opposite side of the fairway), bears about S.W. by W. ½ W. from this beacon.*

Nodding Tommy or No. IV. Beacon is a red spar surmounted with a diamond shaped box, painted *red*, with a horizontal white stripe round centre. It is on the east bank of the river, and about 1 mile above East spit beacon. It marks the east bank of the river.

Middle Bank or No. III. Beacon is a red spar mounted with a *red* spherical cage. It is on the east bank of the river, at low-water mark, about 2¼ miles above Nodding Tommy beacon; Middle Bank shoal, on the opposite side of the channel, bears about S.W. by W. ¾ W. from this beacon. (*See* footnote, page 671.)

Flagstaff or No. II. Beacon is a spar 50 feet high, mounted with two diamond shaped boxes; it is painted *red*, to the lower box; from thence to the upper box *white;* and the remainder *red*. It is on the east bank of the river, planted on dry ground, 7 cables N.E. from Middle Bank beacon.

Fish House or No. 1 Beacon is a spar 40 feet high surmounted by a diamond shaped black box, it is painted black, and situated on the west bank of the river, near some fishing houses, a short distance from the bend that leads to the harbour, marking the channel, in crossing over from the east to the west bank of the river.†

PILOTS.—Pilot vessels, having competent licensed pilots for the Liau ho, will be met on nearing the bar. They carry the pilot flag, yellow over green, horizontal, and the words "Licensed Pilot" with number, on

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* This Beacon is stated to be very slight and hard to discern. Lieut. Pollard, R.N., H.M.S. *Zephyr*, 1882.

† The above descriptions of buoys and beacons have been taken from the Chinese Light List, 1884. Lieut. J. P. Rolleston, of H.M.S. *Foxhound*, gives the following bearings of light-ship and buoys for the season of 1883.

From the light-ship, Ruined tower, S. 49° 30 E.
Tower Hill S. 17. 30 E.

From Entrance Buoy, (Black) Light-ship, S. 64. 30 W.
Tower Hill, S. 9.0 E.
Ruined Tower, S. 38. 30 E.

From Middle ground Buoy, (Red)
Light-ship, S. 76 W.
Ruined Tower, S. 4 E.
Tower Hill, S. 33. 30 E.

From Inner Bar Buoy, (Black)
Light-ship, S. 68° W.
Ruined Tower, S 1° E.
Tower Hill, S. 27 E.

Remarks by J. P. Rolleston, H.M.S. *Foxhound*, 1883.

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the head of the mainsail. There are twelve pilots, who are under the control of the harbour master, under whose directions also vessels are berthed, and are not allowed to shift without his permission. The pilot boats cruize within a radius of 5 miles from the light-vessel, except in bad weather, when they take shelter in Deep Hole.

After the buoys are removed on the approach of winter, and again before they are replaced on the breaking up of the ice, great risk would be incurred by venturing to cross the bar without a pilot, for in 1863, before the establishment of buoys and of qualified pilots, no less than three vessels were lost, and 40 others suffered damage by getting ashore either on or inside the bar. Since 1867 no accidents have occurred. The rate of pilotage is 4 taels per Britsh foot.

TIDES.—It is high water, full and change, at the Liau ho bar, at 4h. 0m.; springs rise 11 or 12 feet, neaps 7 or 8 feet. At Yin-koa, at 5h., and springs rise 12 feet. The rise, especially at neaps, is much influenced by the wind, a southerly breeze causing a rise above the normal height, while northerly winds cause a fall below the same.

It is said that in the summer months the tides are highest after noon, owing to the strong southerly winds during the day. Also that in October and November the winds then prevailing from the north during the day blow the waters out of the gulf and river, hence the highest tides are in the morning, for the nights being calm give the water time to return to its usual height. But although such winds may in some degree affect the levels, these results are due to the ordinary tidal phenomenon of the day tides being the higher in summer and the night tides in winter.

The highest tides occur about two days after full and change; the ordinary spring rise is about 11 feet, but occasionally the rise at neaps is only 5 feet. At times, 4 fathoms can be carried over the bar.* The morning tides (summer season) are least to be depended on, as the rise is then comparatively small. There is usually a fall of from 1 to 2 feet before the ebb stream sets out on the surface; and a corresponding rise before the flood stream makes in. Amid such apparently† irregular tidal variations, it is judicious to have recourse to a pilot, some being always found cruising off the bar, frequently as far to the southward as the Bittern shoal. After a heavy N.E. gale the water will sometimes cease to rise on the bar, a reaction taking place some few days later, when an unusual rise takes place.‡

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* It is so stated; but there is some reason for doubt, as to this point.

† The tides really follow the ordinary laws. The irregularities occur at neaps, when the tide cannot be depended upon.

‡ Lieut. Pollard, H.M.S. *Zephyr*, 1882.

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Outside the bar the flood stream sets N.N.W., finishing at N.N.E. by way of north.* For tides inside the bar, *see* Directions below.

The BAR.—The channel into the Liau ho flows through the mud flat which extends from 4 to 6 miles off the coast. The eastern point of entrance to the river is 3 or 4 miles south of the western. The bar begins at 7 miles south-west of the eastern point, and carries for 2 miles depths of 7 to 9 feet, but in its centre is a bank one mile in length, of only 4 feet.† Thence the channel takes a north-easterly direction towards the east point of entrance, gradually deepening to 5 and 6 fathoms, but shoaling again to 18 feet, which depth may be carried up to Yin-koa. The bar has somewhat altered since the survey of 1860.

The bar is difficult of approach, especially in cloudy weather or when no ships or junks are lying outside, owing to the low land and the extent of the flats. A vessel should not stand nearer in than 4 fathoms. When in 6 fathoms, soft bottom, Tower hill bearing S.S.E., she is in anchorage outside the bar, when she must wait for a pilot; or if drawing 10 to 12 feet, and it being 3 hours flood, she may follow, on a course about N.E. by E., the large five-masted junks going in, which keep strictly in mid-channel. But as soon as the vessel has passed the first fishing stakes, and having 4½ fathoms, soft bottom good holding ground (the bar is hard sand), she is inside the bar, and ought to anchor.‡

Anchorage.—In entering the Liau river, should it be necessary to anchor, do so to the eastward of the light-ship, not more than 1½ miles distant. A vessel, if seen running into danger, will be warned by a gun fired from the Newchwang light-vessel, and the correct course will be signalled by the International Code.

DIRECTIONS.§—Caution.—Vessels that have been kept too far off shore, in order to give the Bittern shallows a wide berth, have been run amongst the dangerous shoals, at the head of the gulf, westward of the Liau ho. This may be easily avoided by following the directions given on page 658.

Crossing the Bar. — The following directions are by J. P. Rolleston, navigating officer of H.M.S. *Foxhound* (1883), and should take

* Lieut. Pritchard remarks, that the flood tide sets strong to the north until within No. V. beacon when it follows the course of the river, tending if anything, to set towards the east bank.—Remark Book, H.M.S. *Fly*, 1881.

† The light-vessel, by request, will signal water over the bar.—C. Jeffrey, H.M.S. *Mosquito*, 1880.

‡ Com. John Ward, R.N., H.M. surveying vessel *Actæon*, 1860.

§ Derived from a "Notice to Mariners," issued by the U.S. Hydrographic Department, October 1867. The bearings do not quite agree with the Admiralty chart.

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a vessel over the bar in deep water. From the light-ship, steer E. by N. ¾ N. midway between buoys, leaving the two *black* buoys on the port hand, and the *red* buoy on the starboard hand. Continue this course until the inner bar buoy bears W.N.W. about ½ a mile, when a N.E. course will lead to Deep Hole, between the fishing stakes. Small baskets painted red are hung on the end stake of each row of fishing stakes on the starboard hand, and similar ones painted black on the port hand. The spar beacon hitherto marked on the chart on the end of East spit does not exist.* —Navigating Officer's Remark Book, H.M.S. *Foxhound*, 1883.

The tides set obliquely across the bar, the flood about N. by E., the ebb about S. by W., at the rate of 2 to 4 knots. With this knowledge the mariner will be able to steer so as to make good his courses. When on the bar, to avoid the dangerous spit on the western bank, do not bring Inner buoy to bear to the eastward of E.N.E. When above Inner buoy, in order to avoid another projection from the western bank, do not bring the same buoy to bear to the southward of S.W. by W. ½ W. until your distance from it exceeds 1¼ miles. The western bank is steep-to; the eastern bank shelves gradually.

Caution.—The foregoing directions must be received with considerable caution, as the bar, and river as far as Deep Hole, is subject to continual change, and local knowledge is desirable.

Up the River.—From Deep Hole, the Admiralty chart, and a careful use of the lead, will enable you to reach the Yin-koa anchorage. Feel your way along the eastern bank, passing within a cable of Nodding Tommy and Middle bank beacons, on which side the deepest water is to be found, until Flag-staff beacon is reached, then strike across for Fish-house beacon, on the western shore, in order to clear the shoal water off Everlasting point.† Then (still guided by the lead) follow the north shore around the bend, until you are well above Everlasting point below Yingtze, when steer for the anchorage off the town.

After passing Everlasting point speed should be slackened, especially if carried up on a strong tide; for the quantities of junks, and large number of vessels at anchor and under weigh renders great caution necessary.‡

Sailing vessels are moored in two lines off the native town. The fair-way is between them.

Steamers anchor above the sailing craft and abreast the Custom House and settlement. If proceeding with the tide, a vessel should pass the

* Or did not in the season of 1883.

† The bank of Everlasting point is stated to have extended considerably.—W. O. Thurburn, Navigating Sub.-Lieut. H.M.S. *Sheldrake*, 1882.

‡ C. Jeffery, Navigating Officer, H.M.S. *Mosquito*, 1880.

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steamers before rounding to ; a running moor is highly unadvisable. The tide runs with great rapidity at springs.*

YINGTZE and YIN-KOA.—The seaport of Newchwang is situate 13 miles above the bar. The name of the town is Yingtze, that of the anchorage off it Yin-koa. It is an excellent harbour, quite landlocked, with a depth of from 5 to 10 fathoms. The foreign settlement (which consists of some 6 or 8 European houses together with 3 or 4 European stores) is above the native town, and occupies about 1,000 yards of the river bank, which is steep with soundings of 7 fathoms close in. The high road to Newchwang and Moukden passes the back of the settlement. The Custom House is a large building with a flag-staff about 100 feet high in its front.* The British Consulate is situated at about 100 yards from the river bank, to the westward of the Custom House;* the number of foreign merchants is small, and there is a resident physician.

The native town, the official name of which is Mu-kow-ying, has a main street fully 2 miles in length, the only noteworthy features of which are the large enclosures in which the native dealers carry on the business of storing and manufacturing the bean cake which is the staple trade of Yingtze. It is a dreary place. The muddy river winds through a plain of mud without a single natural elevation to break the dismal monotony of the scene, and indeed, except for a few weeks during the summer the region in which the port is situated is little more cheerful than an arctic swamp.

The trade is very large, junks from all quarters visit it, and the foreign shipping is considerable. The trade which formerly centered at Newchwang was, owing to the silting up of the higher parts of the river, removed about 20 years since, to Tien-chwang-tai, 17 miles above Yin-koa, and later was transferred to the latter place, which in addition to its proximity to the sea, has the advantage of a good depth of water.

Supplies, &c.—Provisions are abundant consisting of beef, mutton, fish, fowls, eggs, and pheasants and wild geese in season. There are large stores of grain. Coal of good quality can be obtained, also firewood. White hemp rope from 1 to 6-inch, can be purchased at from 5 to 6 cents per pound. With the exception of wages Yingtze is perhaps the cheapest port in China, as provisions are so abundant and the demand is not large. European stores and clothing are usually imported from Shangai, but there are ship chandleries established for the convenience of the foreign shipping.

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* C. Jeffery, Navigating Officer, H.M.S. *Mosquito*, 1880.

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Loss is experienced in the exchange of the Mexican dollar, the value of which varies from 950 cash during the summer, when large dealings necessitate a supply of coin, to 700 cash during the cold season.

Trade.—The total value of the trade of the port for 1882 amounted to 1,904,740*l.*, the bulk of which consists in the export of bean (or pulse) and bean cake to the southern ports, and whilst affording employment to about 300 foreign vessels, chiefly British and German,* is almost exclusively conducted by native Chinese, principally from the southern provinces who have gained complete control of the local markets, for not more than one-seventh of the whole are consigned to, or loaded by foreigners. The exports also include grain of various kinds, oil, cotton, drugs, and furs. The imports consist of cotton and woollen goods, opium, sugar, manufactured iron, glass, &c., and there has arisen a direct trade with Europe in imports, which is improving.

The productions of the neighbouring provinces are wheat and other grain, cotton, silk, indigo, tobacco, and they are rich in mineral resources, consisting of coal, gold, silver, copper and lead.

WINDS and WEATHER.—Mr. Polack remarks† that the winds in the north-east part of the gulf of Liau-tung are very variable. When between S.S.E. and S.S.W., either light with rain squalls, or blowing fresh, or a gale with or without rain from this quarter, there may be expected, without warning, a sudden shift to the North or N.W., blowing furiously for about 12 hours ;‡ sometimes, however, these gales are of longer duration ; on the 9th October 1877, a sudden northerly gale sprung up bringing with it snow and severe cold, this storm after blowing continuously for three days died away ; in six hours after returning with renewed force.§ The pilots state that these shifts are common during the summer, especially after August. Strangers, therefore, ought to be cautious especially when in the vicinity of the Bittern shallows, where a vessel would have no room to keep before the wind.

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* In 1874, since which date there has been a steady increase.

† September 1863. "Mr. Polack put his ship before the wind, not apprehending a shift of this kind, and suffered the loss of topsails, although lowered, and other sails. The squall gave no warning. The barometer scarcely fell. In 14 days three similar shifts occurred."—*Nautical Magazine* for March 1864, p. 165. In October 1860 the same kind of squall was experienced on the east coast by Lieut. Bullock, R.N., of H.M. Surveying vessel *Dove*.

‡ Lieut. G. W. Pollard, R.N., states that on the 21st October 1882, at 2 a.m., when at anchor off the Newchwang light-vessel, a very heavy gale set in from the north-north-eastward, the wind at times reaching to a force of 12 which lasted until the night of the 22nd and raised a sea in which no boat could live.—Captain's Remark Book, H.M.S. *Zephyr*, 1882.

§ Commander Sir W. Wiseman, H.M.S. *Lapwing*, 1877.

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During the summer months the winds are from south-east, south and south-west, but the prevailing winds are from south-south-west. From November to March, north and north-east winds prevail.

Climate.*—The coldest months are December, January and February. The greatest cold of a winter, 10° below zero, generally occurs in January, and the first half of February.

The number of days in any winter that the thermometer stands at day-break below zero, does not exceed ten, and rarely for more than two mornings in succession, and it is never above zero in the afternoons.

The winter is usually ushered in by a snow storm, after which the weather clears up, and hard dry frost sets in, which continues with occasional falls of snow, until the spring. The river becomes closed by ice in the middle or end of November, and so continues till the end of March.

The hottest months are June, July and August, and the greatest degree of heat generally occurs in July and the first half of August. In the shade the temperature does not rise above 80°, except for a few hours during some thirty afternoons in each summer, and these comparatively hot days are distributed, with cool intervals, in groups of three to five throughout those three months. During five years the highest temperature attained was 87°.

The climate is extremely healthy and serious sickness is very rare amongst the foreign residents, although no spot could be less pleasantly situated than Yingtze. On the eastern side of the gulf, the high mountain ranges cause there a greater rainfall and a moister climate.

NEWCHWANG (or Nieu-chwang) **Treaty Port.**—The city which gives its name to this treaty port, is situated in the interior, on the road to Moukden, 27 miles from Yingtze and 70 from Moukden. It is devoid of any commercial importance and almost of population at the present time. It is famous for its excellent water which is used in the manufacture of spirits, and is also noted for the production of saltpetre. It is usually spoken of as lying on the Liau ho, but, according to the latest and most authentic† information, it is 15 miles to the eastward, and is on a small tributary of the Hung ho or Moukden river, which latter falls into the Liau ho 73 miles above the sea, making the distance by water from Yingtze about 90 miles. There has been no trade there for 20 years, when it was removed to Tien-chwang-tai, 17 miles above Yingtze, and large junks have not ascended to Newchwang

* Report of T. T. Meadows, Esq., H.B.M. Consul, 1862.

† *Notes on Manchuria*, with map, by Rev. Alexander Williamson, B.A., published in "Journal of the Royal Geographical Society," 1869.

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for 150 years; and it is believed either that the river has become shallower by silting up or by the upheaval of the country. The Liau ho is still navigable by small junks as far as Tie-ling,* 205 miles from the sea. Moukden, the capital of the province of Liau-tung, is 70 miles from Newchwang by road, and nearly 100 from Yingtze, whilst by water from the latter place it is 140 miles.

There is a great highway road from Peking along the west side of the gulf of Liau-tung, through Kae-chu-fu and Yingtze, to Newchwang and Moukden. Another great highway runs down the eastern side of the gulf, passing through Kae-chu fu, Fu-chu, Kin-chau, the head of port Adams, and then along the coast of the Yellow sea, through Ta-ku-san, to Korea.

* For further information concerning this country northwards, see *Palladius's Expedition through Manchuria*, with map, in "Journal of the Royal Geographical Society" for 1872.

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APPENDIX.

CONTAINING WINDS AND CURRENTS OF EASTERN PASSAGES TO CHINA; N.E. MONSOON ANCHORAGES; CHINESE MONEY, WEIGHTS, AND MEASURES; HONGKONG SIGNALS; TYPHOONS; UNIFORM SYSTEM OF COLOURING BUOYS AND BEACONS IN CHINESE WATERS; TIDE TABLE; AND TABLE OF POSITIONS.

EASTERN PASSAGES; Winds and Currents.

In connexion with the navigation of the eastern passages to China which have been introduced into the first chapter of this volume, it has been deemed desirable to describe the meteorology of localities geographically without the limits which are properly comprehended in this section of the China Sea Directory; and it is on this account it has been placed in the Appendix.

The descriptions which follow are, of the winds, weather, tides, and currents of that part of the Indian archipelago to the eastward of Java and Borneo through which the routes designated "the Eastern passages to China" lie. This information has been chiefly derived from Directions by Captain A. B. Beecher, R.N., late of the Hydrographic Department, Admiralty, and other reliable sources.*

INDIAN OCEAN and EASTERN STRAITS.—WINDS.—On the southern coasts of the islands of Java, Sumbawa, Flores, and Timor, between which are the straits by which the Eastern passages to China are entered, two monsoons prevail, the N.W. monsoon corresponding with the N.E. monsoon of the China sea, and the S.E. with the S.W. The N.W. is also known as the West, and the S.E. as the East monsoon. The influence of the former extends about 200 miles from the coast, the latter is an extension of the S.E. trade wind.

On the south coast of Java the N.W. monsoon ceases in March. In April the wind is unsettled; in May it is steady from East with fine weather; from June to August it is strongest. In October the S.E.

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* *See* also Wind and Current Charts of the Pacific, Atlantic, and Indian Oceans, published by the Admiralty.

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monsoon becomes weaker, and until the return of the N.W. monsoon the wind is variable. From May to November is the rainy season on this coast.

In February and during the first half of March, as well as in October, that is, at the change of the monsoon, land and sea breezes prevail on the coast; but they are not so strong in October as in February or March. In these last two months, and even in April, the land breeze begins with a squall, or sometimes a heavy storm, and as soon as this is over is found blowing moderately, and continuing till the return of the sea breeze. In April and May, on this coast, the sea breeze also begins with a heavy squall or storm of short duration.

In the strait of Baly the wind often blows from North with much violence. In the strait of Sapie, land and sea breezes are found; they come from South in the morning and from North at about two hours after noon, and are frequently separated by an interval of calm. In the other straits east of Java a similar condition of the wind is found, and that also very variable.

JAVA and FLORES SEAS.—The same monsoons prevail in these two seas from Java to Timor. The East monsoon commences in May, the winds varying from East to S.S.E., and attaining their greatest force in June and July. This monsoon is finer than the West monsoon which generally begins in October, and attains its height in January, and brings bad weather, especially in November and December. The rains fall from December to the middle of February, a period of squalls, storms, and severe weather generally. In April the winds become variable, and the weather pretty fine.

On the north coast of Java from May to July the wind is from S.E., with a return of opposite winds varying to N.E.; in October these winds become weak and variable. The N.W. monsoon begins in October, sometimes nearly a month before or after, and ends in March, and is the season of the great rains. In December Westerly winds prevail. Towards the middle of February are storms and rain.

On the south coast of Borneo, the S.E. monsoon prevails from May till September. From September to April the West winds blows on this coast, bringing constant rain and dirty weather. During the S.E. monsoon the weather, which is still wet, is less rainy than during the N.W. monsoon; but it may be broadly stated that a great amount of rain falls upon this coast all the year round.

ISLAND of TIMOR.—On the north-west coast of Timor, from September to March, the N.W. monsoon is found varying to N.N.W. In April or May it is succeeded by that from S.E. varying to S.S.E., which terminates in October. The N.W. monsoon is the bad weather season, and

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in December the winds are violent. This monsoon is only well established here about the end of November or December, when strong winds between West and North, accompanied by rain, continue till February. The strongest winds vary between W. by S. and N.N.E. About the end of April or beginning of May the wind returns to East, varying to South, and blowing fresh on the north coast of this island, where it is then the fine season.

On the southern coasts of Timor there is a great difference in the winds. The S.E. monsoon is light on the south coast, while it is strong on the north. During the first part of October it is stormy on the south coast, but not until December on the north coast. On both coasts during the fine season, the land and sea breezes are fresh. On the south coast the land breeze varies from N.E. to North, and the sea breeze from S.S.E. to S.S.W.

STRAIT of MACASSAR.—In the northern part of the strait from May to October the southerly monsoon is found on the east coast of Borneo. The same also takes place between Celebes and Gillolo; it is succeeded by the northerly monsoon, which continues from November to April.

In the southern part of the strait the wind is from the southward between April and September. During October, November, and December, as well as in the following months, fresh breezes prevail from W.S.W. to W.N.W.

Near the west coast of Celebes from May to October land and sea breezes are found, while on the opposite coast of Borneo the wind is steady from South. From November to April the wind varies from W.S.W. to W.N.W.; in April, May, and June it is from N.E., but light in the month of August.

It has been observed that when the S.W. wind prevails on the coast of Celebes, about 6 leagues off the coast it becomes W.N.W. and N.W. on the coast of Borneo. During the S.E. monsoon a vessel cannot work up against it on the low coast of Borneo for light winds are found in this season, while on the corresponding coast of Celebes, which is elevated, a fresh land wind blows at night followed by a sea breeze during the day. In December the land and sea breezes are generally met near Celebes. In August and September the wind is light, but sometimes off this coast storms from S.W. occur, also long calms.

SEAS of CELEBES and SULU.—In the Celebes sea and Sulu archipelago easterly winds with fine weather prevail in October, but are not regularly established till November. In May the westerly winds replace them and in a month become established, to terminate in October,

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bringing with them a season made up of rain, squalls, and tempests, which take place principally in July and August. In September a heavy mist hangs about the coast of Mindanao.

At the beginning of the westerly monsoon the winds are light for some time with heavy rain, during which the wind blows from an opposite direction, lasting from the eastward sometimes for above a week. Occasionally, heavy storms happen until the westerly winds become established. During the whole of this monsoon the weather is cloudy, rainy, and sometimes stormy, and in this season, between Celebes and Mindanao, sudden and violent storms take place from N.W. The westerly winds sometimes last till November.

In the Sulu sea the East or N.E. monsoon is not a steady fresh breeze, but often variable. Near Mindanao the northerly winds never blow fresh, and light changeable winds often displace them for several days. The same occurs at the end of January, and it is considered that the same winds prevail from the Sulu archipelago to Manila. The S.W. monsoon is not observed here till some time in May, and does not become regular till June. During this monsoon the weather is gloomy, cloudy, and very wet. About the end of July or middle of August, and sometimes also in October, bad weather occurs, and severe storms called "collas tempestados," which are generally accompanied by thunder and lightning, the wind changing about and blowing from all points of the compass with equal force; they are not unlike the typhoons. In September the wind loses strength, the rain is less, and the sky is fine, but in the mornings there is a thick fog which lasts till noon. At the change of the monsoons bad weather is sometimes felt, as in the China sea. The above is also a description of the weather prevailing amongst the Philipine islands.

ISLAND of CELEBES.—The island of Celebes like that of Borneo is divided by the equator. On its south coast the S.E. monsoon is established from May to October, and the S.W. monsoon prevails at the same time on that part of the island which is north of the equator. The S.E. monsoon, lasting from May to October on the coast south of the equator, brings the driest season. The N.W. monsoon replaces the S.E. towards October, and lasts till April, rain is then almost perpetual and the wind strong.

During the two months when the sun is nearly vertical over the island, and near the syzygies, northerly winds and rain always occur. On that part of the island, north of the equator, the N.E. monsoon in October replaces the S.W., making the fine season. At the north-eastern part of the island the driest season is August, when cloudless skies and southerly winds prevail.

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TIMOR, BANDA, and ARAFURA SEAS.—In the Timor sea, and also in the Arafura sea, the S.E. monsoon blows with much regularity, and towards the middle of it, from May to August, it varies from S.S.E. to S.E., and is then strong, with a high sea. The Malays call this the white season. In the beginning and towards the end of this monsoon the wind is East, sometimes veering to E.N.E. The wind is generally fresh and steady when the moon quarters, and unsettled with calms at the time of the syzygies, a fact also observed in the trade wind of the east coast of Australia. The S.E. monsoon terminates in the beginning of October, when, after a few weeks of variable winds, the westerly monsoon sets in, and continues without intermission until the beginning of March. In the southern part of the Eastern archipelago the East monsoon is attended with fine weather, but on the south-west coast of New Guinea, and among the islands to the westward as far as the east coast of Celebes, frequent squalls with heavy rain are experienced at this season, often accompanied with considerable swell from the southward, while, during the remainder of the year, the weather is fine. This rule, however, does not extend farther to the westward, for westward of Celebes the West is the rainy monsoon. The monsoons here, when at their height, usually blow in an E.S.E. and W.N.W. direction, but towards the changes they draw round more to the southward, sometimes continuing several days at S.W.

MOLUCCA CHANNELS.—In these seas also two monsoons are distinguished which seamen call the N.W. and S.E. monsoons, some saying that the winds hang more to the northward than westward, and more to the southward than eastward. The first corresponds to the N.E. monsoon north of the equator, the second to the S.W. monsoon. It is known, indeed, that the monsoons which prevail in these channels are much less regular than in the open seas; and that according to the time of year North and West winds prevail in turn, as well as those from South and East during the other monsoon. It may be noticed generally in these seas that south of the equator, as far as 10° or 12° S. lat., the direction of the wind varies 10 or 12 points from that of the prevailing wind north of the equator at the same time; that is, if a ship north of the equator have the wind from North, another ship south of it will have it from W.N.W. and if the first ship have the wind South the latter will have it E.S.E. or East. But to avoid confusion arising from this, the old names of the N.W. and S.E. are here preserved according to the case in question.

The general law observed in these two seas is, that the N.W. monsoon commences in the first part of November and does not attain its height till December. It continues till the end of March, a time when calms, light winds, squalls, and rain occur. The S.E. monsoon commences in April,

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gradually increasing till May; it ends in October, when the winds become variable. This monsoon is subject to calms, and the wind is not so strong as that of the N.W. Besides this, the changes of the monsoons do not take place at regular periods.

North of Boero and Ceram the S.E. monsoon varies from S.S.E. to S.S.W.; at Amboina from East to S.E. At these islands the N.W. monsoon varies from W.S.W. to N.W. This last, here called the west monsoon, is the season of storms in these islands, and ends in April. The S.E. monsoon begins in March and lasts till November, bringing the rainy season. In the Moluccas, during the S.E. monsoon, violent storms are met with, and rain falls abundantly over the large islands of the archipelago. In November this monsoon ceases, but the N.W. monsoon does not become established for some time after, for during two months the winds are variable, as they always are in close seas towards the end of the monsoons. From October to April the weather is tolerably fine.

In the Moluccas, situated between 5° S. and 1° N. lat., the winds are much less regular than in the contiguous seas, the result probably of the great difference in direction of the monsoons in the two hemispheres.*

NEW GUINEA.—On the west coast of New Guinea are also two monsoons, the S.E. lasting from April to October, and the N.W. beginning with the end of October and terminating towards April. In January, near this island, the wind sometimes varies from N.N.W. to N.E. In the spring the weather is often changeable, and in March, April, and May it is squally. From June to September a great deal of rain falls; from October to May the weather is fine and calm, without either cloud or fogs.

GENERAL REMARKS.—MALAY ARCHIPELAGO.—From the foregoing the following general remarks on the winds and weather of the Malay archipelago have been deduced.

North of the Equator.—North-easterly winds prevail from December to March inclusive. This is the fine season, the winds blowing strong and steadily, except in the Sulu sea, where variables prevail.

Southerly winds prevail from May to September inclusive. This is the wet season, and the winds are variable in force and direction with bad weather. Sudden and violent squalls from the north-west occur in the Celebes and Sulu seas.

October and November are unsettled months; the N.E. monsoon not being fairly established before the middle of December.

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* It has been remarked that after the monsoons are established, particularly during the S.E. and S.W. monsoons, that in passing from one to the other, both in Gaspar strait and in the Molucca passage, the wind draws round gradually by the south.

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South of the Equator.—West and north-west winds veering to north-east prevail off the coasts of New Guinea from November to March. On coasts having a northern aspect, land and sea breezes, with unsettled weather, and rain will be found.

South-east and east winds prevail from May to September, generally fresh and steady, with fine weather, on coasts with a northern aspect, but bringing rain and bad weather to coasts open to the southward.

Rainy Seasons.—In this archipelago situated as it is in the vicinity of the equator, and within the regions of calms and doldrums caused by the meeting of the northern and southern wind systems, the wet and dry seasons are not strongly contrasted, as a great amount of rain falls more or less all the year round. The same monsoon is often stormy at sea, but fine near the land; as a rule, bad weather with rain is felt on coasts and islands that lie to windward, whilst leeward coasts enjoy fine weather.

CURRENTS of the EASTERN PASSAGES.—The currents in the passages east of Java are very various, and have not yet been reduced to any fixed laws. The great irregularities they appear to be subject to is doubtless due to their geographical relations, lying as they do between the wind systems of the northern and southern hemispheres, which produce currents, more or less regular, which are very apparent at neaps, but are accelerated or opposed during spring tides. But as their action is frequently of importance in endeavouring to make a passage against adverse winds, they require much attention. The imperfect notes which follow are given as a guide to their general character.*

On the South Coast of Java, where the monsoons are liable to great deviations, there are some remarkable reverse currents experienced within a degree or two of the coast. Lieutenants Rietveld, Eschauzier, and others of the Netherlands navy, say that during the easterly monsoon, April to November, a constant easterly current is encountered running against the monsoon, at times so strong as to ripple, but on an average 10 to 12 miles a day. The drift is frequently to S.E. two-thirds of a mile an hour. Captain M. H. Jansen has stated that in the east monsoon the current sets to the westward from full to change of the moon, and either to the eastward from the change, or that there was no current. It is also certain that there is a considerable set to the westward in this monsoon, especially near the shore. In the west monsoon the current is sometimes to the S.S.E. and South, decreasing in force between 11° and 15° S. lat., and then ceases, and a strong westerly current is encountered increasing in velocity as Sunda strait is approached, amounting at times to 42 miles a day.

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* *See* Current Chart of the Pacific, Atlantic, and Indian Oceans.

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In Baly Strait the currents or tides run through the narrows with exceeding velocity, some say 6 knots, and cause great ripplings, eddies, and a boisterous sea, particularly near the shore of Baly during the S.E. monsoon, when the S.S.W. winds blow so strongly that it is often impossible to manœuvre a ship. The flood runs to the northward and the ebb to the southward, and it is high water, full and change, between 10h. and 1h. At neaps the tides are irregular. They change first on the Java side of the strait, and about two hours later on the Baly side. During the east monsoon the flood is often only found near the Java shore, and even then not to the northward of the strait, but during the west monsoon the northerly currents prevail. A tide often lasts for seven or eight hours.

Ombay Passage.—The currents are strong, with great ripplings, in the Ombay passage and the other passages northward of Timor, generally setting to the N.E. during the west monsoon, and to the S.W. during the east monsoon; but in some places, close in shore, weak tides have been experienced. The strong current in the Ombay passage seems to cause a strong Easterly current along the north coast of Ombay during the east monsoon.

In June the S.W. current of Ombay passage attains its greatest strength amounting to from 72 to 80 miles in 24 hours. Near the end of the east monsoon in August and September, there are strong easterly currents in Ombay passage, though in October they often run with great velocity to the south-westward.

Near the entrance of the straits of Allor and Pantar the current takes a northerly direction during the east monsoon, but during the west monsoon it sets out S.S.W.

Java to Amboina.—Ships from Java or Macassar bound to Amboina or the Molucca channels during the east monsoon work along the north coasts of Sumbawa, Flores, Ombay, &c., till they have reached the N.W. or North point of Wetta, or farther eastward if bound to Banda, and the voyage is often much accelerated by favourable currents.

Molucca Channels.—During the east monsoon, the current sets to the north-west along the western coast of New Guinea, and between the Ki and Arrou islands, and thence westward along the south coast of Ceram, at the rate of 1 or 1½ miles an hour, according to the strength of the wind, the velocity being greatest along the coast of New Guinea. At the same period an easterly current prevails on the north side of the islands extending from Timor to Timor Laut, so that a moderately fast vessel would experience no difficulty there in beating up against the monsoon. In the west monsoon the current in these seas usually sets with the wind, but its velocity is not so great as during the other season.

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TABLE of COAST ANCHORAGES, where shelter may be obtained by Vessels of light draught making the passage from HONGKONG to SHANGHAI during the adverse Monsoon.

Anchorage.	Approximate distance from Hongkong Roads.†	Approximate distance from last-named Anchorage.†	Remarks.
	Miles.	Miles.	
Small bay north of Mirs point	28	—	Fair anchorage.
Samun road	32	9	Secure, with perfect shelter from N.E. monsoon.
Harlem bay	48	15	Good anchorage.
Goat island. (S.E. of Tsiech point)	80	35	Good and well sheltered.
Chelang point. (Westward of Fort)	89	9	Shelter, but indifferent anchorage.
Chino bay	103	15	Good shelter.
Cupchi road. (South of Shag rock)	117	20	Fair anchorage, but with heavy swell occasionally from the southward.
Tungao road	128	18	Fair anchorage, but with heavy southerly swell.
Breaker point. (West of Islet)	134	7	Fair anchorage.
Haimun bay. (N.W. of Parkyn's rock and south of Rocky head.)	158	20	Fair anchorage, but Hope bay is much to be preferred.
Hope bay. (West of Fort at Tide point)	167	10	Secure and good.
*Baylis bay. (South entrance to Namoa strait)	186	20	Secure. There is good anchorage to be obtained anywhere in Namoa strait.
Owick bay. (N.W. of Owick point)	210	25	Secure anchorage. (Distance from Baylis bay measured through Namoa strait.)
Jokako point. (West of the point)	215	5	Passable anchorage.
Thunder head. (Westward of the head)	227	13	Secure anchorage.
Tagau point	242	17	Fair anchorage.
Red bay	251	10	Passable; generally heavy swell from southward. (Distance measured through Blakeney pass.)
Notch island	264	15	Indifferent anchorage.
Ting-tai bay. (West of Table head)	269	5	Fair anchorage.
Leeo-lu bay	288	21	Fair anchorage; swell from south-eastward.

* Typhoon harbour.

† These distances are measured along the inshore track recommended for vessels of light draught bound northward during the N.E. monsoon, *see* page 45.

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Table of Coast Anchorages, &c.—*continued.*

Anchorage.	Approximate distance from Hongkong Roads.†	Approximate distance from last-named Anchorage.†	Remarks.
	Miles.	Miles.	
Chimmo bay	312	24	Secure anchorage.
Tongbu	328	17	Fair anchorage.
Port Matheson	336	9	Good anchorage.
Rogues point	343	10	Fair anchorage.
Lamyit island. (West bay)	366	24	Secure anchorage.
West of Kerr island	379	14	Secure anchorage. (Distance measured through Hungwha passage.)
Station island. (Haitan straits)	389	10	Secure anchorage. (Anchorage may be obtained anywhere in Haitan straits.)
Tongsha island. (White Dogs)	430	41	Secure anchorage.
Matsou island	439	11	Secure anchorage.
West of Flap island. (Che-yang-pau)	469	31	Good anchorage.
*Little pass. (Typhoon anchorage for one vessel *only*)	489	21	Secure anchorage. (Distance measured through Seon channel.)
*Pih-quan harbour	507	19	Secure anchorage.
*Bullock harbour	558	52	Secure anchorage. Very good anchorage also west of Takew island.
West of Taluk island	580	24	Secure anchorage. (Vessels of less than 14 feet draught can proceed via Sanpwan pass.)
Song-men point	593	15	Secure anchorage.
Tai-chau islands	614	21	Secure anchorage.
Chuhseu	623	14	Secure anchorage.
Barren bay	629	8	Good anchorage.
Leaming island	647	17	Good anchorage.
*Sheipoo roads	656	11	Secure anchorage.
Duffield pass	691	39	Fair anchorage.

NOTE.—In the inshore passage between Duffield pass and Shanghai, the N.E. monsoon has but little force, and the great velocity of the tide is the only thing to be guarded against.

* Typhoon harbour.

† These distances are measured along the inshore track recommended for vessels of light draught bound northward during the N.E. monsoon, *see* page 43.

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CHINA.

Money, Weights, and Measures.

MONEY.—The circulating medium, in transaction with foreigners at the open ports is chiefly whole or broken dollars, clean or "chopped"*; and the value of the dollar in relation to the tael is variable, the latter being approximately one third more.

COMMERCIAL WEIGHTS.—The unit of the table is the *liang* or *tael.*

The picul and catty are chiefly used in dealing with foreigners. The following equivalents will be found useful:—

1 ton	is equal to	16	piculs, 80 catties.
1 cwt.	- - =	84	catties.
1 lb. avoirdupois	=	¾	of a catty or 12 taels.
4 ozs.	- - =	3	taels.
1 picul	- - =	1·19047	cwt. or 133⅓ lbs.
3,000 taels	- - =	302	lbs. troy.
1,550 cash	= 1 tael =	5*s.* 6*d.*	
10 mace	= 1 ounce =	1⅓	ounce avoirdupois.
16 ounces	= 1 catty =	1⅓	lbs. avoirdupois.
100 catties	= 1 picul =	133⅓	lbs.

Chinese weights and grain measures, also the linear long and land measures, all vary in different parts of the country, but as a general rule they are largest and longest in the southern provinces.

The difference in the values of the weights above the tael, as fixed by treaty, and those in common use in China, are as follows:—

	British Treaty.	French Treaty.	Common weights.
Tael -	1·333 oz. avoir.	37·783 grammes.	1·328 oz. avoir.
Catty -	1·333 lbs. „	604·53 „	1·326 lbs. „
Picul -	133·33 „ „	60·453 kilogr.	132·6 „ „
Stone -	159·99 „ „	72·544 „	159·1 „ „

MEASURES.—The *li* is generally estimated by foreigners to be about one-third of a geographical mile.

Length.	1 gran	is equal to	1 *fun.*
	10 fun - - -	=	1 *tsun* or inch.
	10 tsun - -	=	1 *chih* or foot = 14·1 inches.
	10 chih - -	=	1 *chang* or pole = 11·75 feet.
	10 chang - -	=	1 *yin.*

These are taken from the "Chinese Commercial Guide," by S. Wells Williams, an excellent work.

* "Chopped" dollars are those which are stamped all over and defaced with innumerable, private, commercial (or hong) marks. "Clean" dollars have no mark or stamp whatever.

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Man-of-War Signals &c. from the Signal Station, Victoria Peak, Hongkong.

Men-of-war are signalled at the *Inner* Halliards on Yard thus—

Line of Battle Ship - - -	*A Diamond.*
Frigate - - - - -	*A Square.*
Corvette - - - - -	*A Ball.*
Paddle Steamer - - - -	*A Triangle, point up.*
Despatch or Gun-boat - -	*A Triangle, point down.*

Merchant vessels are signalled at the *Outer* Halliards, thus—

Steamer - - - - -	*A Diamond.*
Ship - - - - -	*A Drum.*
Barque - - - - -	*A Ball.*
Brig - - - - -	*A Triangle, point up.*
Schooner - - - -	*A Triangle, point down.*

The Commercial Code is used at this Port.

The Union Jack will be hoisted at the masthead when any vessel is being signalled.

The Red Ensign at the masthead will denote that a British functionary of rank is on board of a vessel approaching.

The National or House Flag will be hoisted over the symbol, when either is flying on board the vessel signalled.

The signals of vessels in the offing will be repeated. In making signals to men-of-war in the harbour or in the offing a White Ensign will be hoisted at the flagstaff, and at the masthead of the men-of-war.

All distance signals will be made at the masthead, and all compass bearings will be made at the yard.

On a steamer or the smoke of a steamer being sighted, the compass bearing over proper symbol will be hoisted at the yard arm, and the distance off in miles will be hoisted at the masthead. The distance signal will be kept up ten minutes, and the compass signal until the steamer is made out. When the steamer is made out, if it is an English, French, or American mail steamer, a gun will be fired and the distance off at that moment will be hoisted under a ball at the masthead. The compass signal will then be hauled down and the proper National or House Flag will be substituted for it. The masthead signal will be kept up ten minutes, and the yard arm signal until the steamer anchors.

For any other than a mail steamer, the same signals, with the exception of the gun and ball, will be used.

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River steamers will not be signalled. Other steamers from Macao and Canton will be made known by showing the National Flag and symbol, at west yard arm only.

TYPHOONS.*

The destructive typhoon that visited the harbour of Victoria (Hongkong) in September 1874 will ever be remembered by the inhabitants of the island for its exceptional violence, and the enormous loss of life and destruction of property with which it was attended.

The following description of this typhoon is derived from the Navigating Officer's Remark Book of H.M.S. *Princess Charlotte* (1874):—

"The morning of the 22nd commenced fine, with the barometer at 29·80 (the average of the previous four days); as the day advanced the atmosphere became unsettled, and notwithstanding that the wind was N.W. it was accompanied by an oppressive heat, the thermometer being 85°; the barometer began to fall about noon, steadily decreasing until, at 4 p.m., it registered 29·69. The wind, which at this time was about N.N.W., began to blow in fitful gusts across the harbour, and it became evident that a typhoon was approaching. The glass continued falling slowly until 10h. 30m. p.m., when it stood at 29·40, the wind having veered to north. Between 10h. 30m. p.m. and 2h. 0m. a.m. it fell upwards of $\frac{1}{2}$ an inch, and stood at 28·83 (its lowest reading), for about an hour. At 2h. 0m. a.m. the wind suddenly shifted to N.E., and then to E.N.E., and blew with terrific violence. The strength of the wind brought an immense volume of water into the harbour, not a tidal wave, but a rapid rise which continued for about an hour, flooding the 'Praya' (or embankment) and the ground floors of the houses to a height of 4 and 5 feet for some distance inshore; although, according to ordinary calculation, it should have been low water at 2h. 0m. a.m.; by 3 o'clock the water had risen from 5 to 6 feet above its high-water level, giving a rise of 10 feet: as the storm subsided the wind gradually veered to S.E. The barometer rose steadily, and at 7h. 0m. a.m. it was fine. From the log books of ships which fell in with this typhoon at sea it was ascertained that it blew with great violence in the neighbourhood of the Pratas shoals, the American barque *Highlander* having them in sight when the centre passed over her, two other vessels being close to at the same time, namely, between the hours of 4 and 6 p.m. of the 22nd. The storm travelled thence in a north-westerly direction, the Spanish steamer *Formosa*, in lat. 20° 50′ N. and long. 115° 20′ E., being on its western limit; the centre must have passed just south of Hongkong at about 2h. a.m. of the 23rd, its *full* burst being

* Six typhoons crossed Hainan in 1880, and four in 1881.—Lieut. A. Carpenter, R.N.

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apparently expended at Macao, where it raged about 4h. a.m., the barometer at that place registering then 27·95, or nearly *one inch* lower than at Hongkong.

The *Princess Charlotte* laying off Kowloon, in consequence of the precautions taken, rode out this storm very easily. She laid with 100 fathoms of 2¼ inch chain on a 95 cwt. anchor, backed by a 40 cwt. anchor; in a good bottom of soft blue mud and never started an inch. H.M.S. *Elk*, moored near her, drifted a long distance, notwithstanding that she was steaming full speed with three anchors down. The scene from our decks at daylight was horrible; the French mail steamer *Ava* and the English barque *Charlotte Andrews* being I think (besides ourselves) the only vessels that escaped with immunity. The sea all around as far as the eye could reach was covered with wreckage of junks and sampans; and steamers and vessels were lying sunk or dismasted in all directions. The loss of life was also very great, over 200 Europeans alone being drowned; amongst the floating population of Chinese about 1,000 bodies were buried; but as a great many went down in their vessels, or were floated out to sea, it was estimated that not less than 3,000 could have fallen victims to this terrible typhoon."

In September and October 1878 H.M.S. *Nassau* encountered typhoons, one while at anchor, the other while at sea; the former of these is here briefly alluded to, as being useful to small vessels similarly circumstanced; and the latter as affording a remarkable example of a vessel running out of a straight gale into a typhoon.

Of these storms Captain Napier writes as follows:—

"Steaming along the China coast, northward from the Incog islands, in September 1878, and being warned by the unusually heavy easterly swell and other signs of the probable approach of a typhoon, an endeavour was made to reach safe anchorage under the Tai-chau islands; the weather, however, looked so threatening on the afternoon of the 17th that it was feared, before the ship could cover the 20 miles necessary for that purpose, with such small steam power, and a head wind to contend against, she might be caught by the full fury of the storm, and the time being insufficient to stand to sea and secure a good offing, it was deemed more prudent to seek shelter in the small strait formed by the two islands lying close eastward of Tiow-pung, where (though but in 3 fathoms water) she would be fairly protected by the surrounding islands and shoals from wind and sea, except between south and S.E. by S., while having room to slip her anchors and run in almost any direction in case of need. Here with three anchors down and no top hamper aloft (steam being handy, and used as required), she was able to ride out the storm with safety. The full force

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of this typhoon was not felt until noon of the 19th, when it blew furiously from the north-westward; the lowest reading of the barometer being at 1h. 30m. p.m. 29·236. By the evening of that day the gale had entirely subsided."

"In October 1878 the *Nassau* (then on passage from Shanghai to Hongkong), having started from the Yangtze entrance with a moderate north-easterly breeze (gradually increasing to a gale as she neared the Formosa straits), ran into the dangerous quadrant of a typhoon travelling north-westward. Sail had already been reduced to a reefed fore topsail (lowered on the cap,) and an inner jib. Pitching heavily, the ship had (previously to the gale), lost both jibboom and jib. The wind (naturally) continuing in the same (N.E.) quarter, with a high and unchanged barometer, that gave no warning during the first 24 hours of the storm, it was not at first realised that the vessel was in front of a typhoon. After the *Nassau* had been brought to the wind, while lying to on the starboard tack, it became necessary to cut away the lee cutter, she having filled during a heavy lurch, carrying away the securing ropes, and bending and crippling the foremost davit, so that each succeeding lurch seriously endangered the channel plates and risked the lower rigging. The *Nassau* lost in this storm one boat, two inner jibs, and a fore staysail."

A very heavy typhoon was experienced by H.M.S *Albatross—at sea*, on her passage from Shanghai to Najasaki in September 1880.

It is thus described by Lieutenant Harry C. Martin of that vessel:—"H.M.S. *Albatross* left Shanghai at 4 p.m. of the 31st of August (1880), anchoring for the night off Kiu-toan, and proceeding the next morning at 8 a.m. Experienced outside light-vessel a very long swell from the south-eastward, wind E.N.E., and glass steady. 2nd September, swell very heavy from eastward, wind N.E. 3rd, glass began to fall, wind north-easterly. Last position obtained by observation this day, lat. 31° 48′ N., long. 125° 8′ E., no current; 8 p.m., wind freshening, put the ship under fore and aft sails, steering full and bye, steaming 54 revolutions (heavy swell). 4th, glass falling steadily (29·58), wind steady from N.E. by N. increasing rapidly. Down top-gallant masts, in jib, took in second reef of spanker, secured boats for heavy weather, 10 a.m. set fore staysail. Noon, glass still falling, heavy sea rising with continuing long swell, glass 29·38. 8 p.m., gale rapidly increasing with severe squalls, constant heavy rain, and a nasty cross sea, ship behaving well, steaming 50 revolutions under double reefed fore and main gaff sails, close reefed spanker and fore staysail; wind very steady N.E. by E. blowing very hard indeed. 5th, glass still falling, wind coming round to the eastward, heavy rain, and angry

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sea, 10.40 a.m. close reefed gaff sails, lay to on starboard tack. Just about this time the wind suddenly lulled and became very light for an hour, shifting to S.E., and as it freshened, working rapidly round to S.W., glass 28·45. The glass commenced to rise immediately after the wind lulled; it again blew hard from S.W., with very violent squalls, accompanied by heavy rain until midnight, glass rising steadily. 6th, during the middle watch the wind began to lull, and at 4 a.m. the bar was 29·51, sea subsiding and squalls decreasing fast, rain at intervals, wind working back to the south-south-westward; 9.40 a.m. made sail and shaped course N. ¾ E., lay to during the night, weather still thick with rain. At 4 a.m. of the 7th, shaped course east to make the land, not having had sights since the 3rd; 10h. 15m. a.m. observed the land ahead, weather thick with passing showers, 3 p.m. made out the land and found the ship's position. Since noon of the 3rd, had been drifted some 80 miles to the northward, 6 p.m., Cape Goto S. ¼ E., midnight rounded Cape Goto and anchored at Nagasaki at 3h. 40m. p.m. on the 8th."

NOTE.—In the footnote to page 11 of this work, allusion has been made to the fact that in some cases the centre of a cyclone may bear 10 or even 12 points from the direction of the wind.

That in many instances considerable indraft does occur, rendering some modification of the 8 point bearing necessary, has been made evident by the case of the *Charles Heddle* which was investigated in great detail by Piddington*; and also that of the *Thalia* mentioned by the same authority, and more recently in the great Atlantic hurricane of August 1873. From the investigations of Lieutenant Carpenter, R.N. (who examined the logbooks of several vessels), it would appear that the incurvature in the case of the typhoon experienced by H.M.S. *Nassau* on September 19th, 1878, amounted to as much as 3½ points near the centre.

Though greater research is needed to prove conclusively whether the indraft is greater near the centre, or at a considerable distance therefrom, (and there is much difference of opinion on this point,) it has been conceded by some of the highest authorities that *incurvature* certainly exists in some portion of the area of the storm circle.†

If we admit, therefore, a certain amount of indraft, or incurving of the wind in a cyclone or typhoon, Dové's table for the Northern hemisphere should be so far modified as to substitute the words "keep the wind on the

* PIDDINGTON. Sailors Horn Book, 2nd edition. Pages 88 to 94, and page 156.

† Remarks on Revolving Storms, 3rd edition. Published by order of the Lords Commissioners of the Admiralty. Pages 8, 32, and 35.

MELDRUM. Notes on the forms of Cyclones in the Southern Indian Ocean, and on some of the rules given for avoiding their centres, reprinted by the Meteorological Office. London, 1878.

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" starboard quarter " "so long as this can be done with safety," for every case in which it is recommended in the table to run dead before it.

UNIFORM SYSTEM OF COLOURING BUOYS AND BEACONS IN CHINESE WATERS.

The following system of colouring buoys and beacons in Chinese waters has been adopted by the Chinese Government.

The side of the channel is to be considered starboard, or port, with reference to the entrance to any port from seaward.

Buoys.

1. Buoys coloured *red* mark the starboard side of the channel, and must be left on the starboard hand by vessels entering.
2. Buoys coloured *black* mark the port side of the channel, and must be left on the port hand by vessels entering.
3. Buoys painted in *red and black horizontal bands* mark the fairway, and should be passed close-to.
4. Buoys painted in *red and black vertical stripes* mark the ends of spits, and the outer and inner extremes of banks, shoals, or extensive reefs, where there is a navigable channel on either side.
5. Buoys painted *red and black chequered* mark rocks in the open sea, also obstructions of small extent having channels on either side of them. When marking the latter, they will be placed seaward of the danger.
6. When two *chequered* buoys—*red and white* and *black and white*—mark an obstruction, the *red and white* buoy marks the starboard side of the channel, and must be left on the starboard hand by vessels entering; and the *black and white* buoy marks the port side of the channel, and must be left on the port hand by vessels entering.
7. Wrecks will in all cases be marked by *green* buoys, with the word *wreck* painted on them in *white* letters; when a wreck lies in

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Barometer mannual (1884). Issued by authority of the Meteorological Council. Pages 35 and 37.

Piddington. Sailors Horn Book, 2nd edition, 1855.

Redfield. American Journal of Science and Art, 2nd Series, No. 1 .Page 14.

Shück, Captain A. Die Wirbelstünne, 1881.

Scott, Robert, H. M.A., F.R.S., Secretary Meteorological Office. Elementary Meteorology, 1883. Page 372.

Toynbee. Captain H., F.R.A.S., Marine Superintendent, Meteorological Office. Paper on the great Hurricane of August, 1873. Pages 11 to 17.

Willson. (*See* Admiralty pamphlet on Revolving Storms. Pages 34 and 35.)

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the open sea or in a position where there is a navigable channel on either side of it, the buoy will carry no other distinguishing mark, and will in every such case be placed seaward of the wreck.

The numbers on wreck buoys will be painted in *white*, and placed above the word *wreck*.

Wreck buoys marked with an *even* number must be left on the starboard hand by vessels entering.

Wreck buoys marked with an *odd* number must be left on the port hand by vessels entering.

NOTE.—All other distinguishing marks to buoys will be in addition to the foregoing, and where such are employed, a particular description of them will in each case be given in the published List of Chinese Lighthouses, &c.

Each buoy will have an iron plate on its outside, above the water-line, with the name of its district and station (as given in the published List) stamped thereon in English and Chinese, to insure its identification if found adrift.

BEACONS.

1. Beacons coloured *red* mark the starboard side of the channel, and must be left on the starboard hand by vessels entering.
2. Beacons coloured *black* mark the port side of the channel, and must be left on the port hand by vessels entering.
3. Beacons painted in *red and black vertical stripes* mark spits, and the outer and inner extremities of banks, shoals, or extensive reefs, where there is a navigable channel on either side.
4. Beacons painted *red and black chequered* mark rocks in the open sea, also rocks of small extent having channels on either side of them.
5. When two *chequered* beacons—*red and white* and *black and white*—mark a rock or reef, the *red and white* beacon marks the starboard side of the channel, and must be left on the starboard hand by vessels entering; and the *black and white* beacon marks the port side of the channel, and must be left on the port hand by vessels entering.

NOTE.—The above rules for painting beacons apply in each case to the body of the structure. When a beacon painted a single colour, either black or red, is surmounted by a distinguishing mark, such mark may be painted the same colour as the body of the beacon, or with that colour and white combined, or white alone.

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When the body of a beacon is painted in two colours, the same colours only may be used for the mark surmounting it. Whenever a distinguishing mark is used, a particular description of it will be given in the published List of Chinese Lighthouses, &c.

Beacons on shore, to enable bearings to be taken, or to give lines of direction for crossing bars or entering rivers, harbours, &c., are to be painted so as to make them as conspicuous as possible. Red, black, and white are the only colours to be used, and a particular description of such marks will be given in the published List.

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TIDE TABLE.

For the Coasts of China, Formosa, and off-lying Islands; the North Coast of Luzon and Bashee Channel; the Eastern and Yellow Seas; and the Gulfs of Pe-Chili and Liau-tung.*

Place.	High Water, Full and Change.	Rise. Springs.	Rise. Neaps.
	h. m.	ft.	ft.
Bashee and Balintang Channels.			
Babuyan islands (Port San Pio Quinto, Camiguin island)	6 0	6	
Babuyan islands (Port Musa, Fuga islands)	—	5	
Bashee islands, Batanes	—	4	
Paracel islands	6 0?	8	
Pratas shoal	4 0?	5	
Formosa Island.			
Takau harbour	8 30	4	
Port Kok-si-kon	11 30	3	
Wankan banks	10 0	10	5
Tongsiau	10 0	8–10	
Makung (Pescadores)	10 30	9½	7
Tamsui harbour	11 45	7–10	
Ke-lung harbour	10 30	3	
Sau-o bay	5 50	6	4½
Islands N.E. of Formosa.			
Meiaco Sima, (Port Haddington)	6 45	7	
Luchu islands	6 38	6½	
Canton and West Rivers.			
West river entrance, or Broadway	11 0	7½	
West river, Sam-shui	In Feb.	5–6	
„ Shoa-king		3	
„ Wu-chu fu		1–1½	

Place.	High Water, Full and Change.	Rise. Springs.	Rise. Neaps.
	h. m.	ft.	ft.
***Canton and West Rivers*—cont.**			
Canton river entrance	10 0	8	
„ the Broadway	11 0	7½	
„ Typa anchorage	10 0	7	
„ Macao	10 0	6½	
„ Cumsingmum	0 6	6½	5½
„ Urmstone bay	10 30	7	
„ Lintin island	noon	7½	
„ Fan-si-ak channel	1 0	7½	5
„ Lankeet island	11 20	6½	5½
„ Chuen-pee point	noon	7½	
†Whampoa docks	March 1 40	7–8	
	April 1 15		
	May 0 30		
	June 0 30		
„ Kuper islands off Canton City	March 2 40	5½	
	May 1 40	5½	
	June 1 40	5½	
Western branches of Canton river, Junk-fleet entrance	11 50	6½	
Western branches of Canton river, Wang-mun channel	11 50	6½	5½

* *See also* Admiralty Tide Tables.

The height of the tide in this Table is calculated from the mean level of the low water of ordinary springs, because the soundings expressed in most charts are reduced to that level. The height, therefore, which is given at each place is the actual rise of high water above the mean low-water level of spring tides.

On the coasts of China, the highest tides take place, generally, two transits after the new and full moon. The tides are affected, in many places to a considerable extent, by diurnal inequality.

On page 98 of the Admiralty Tide Tables will be found a convenient method of deducing the height of the tide at any intermediate hour between high and low water. *See also* "Admiralty Manual," Chapter on Tides.

† At Whampoa Docks—In March, the day and night tides rise to the same level. From April to October, the day tides are the higher, and from November to February the lower. In May and June the level of spring tides is 4 feet, and the neaps 2 feet higher than in March.

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Tide Table for the Coasts of China, Formosa, &c.—*continued.*

Place.	High Water, Full and Change.	Rise. Springs.	Rise. Neaps.
	h. m.	ft.	ft.
***Canton and West Rivers*—cont.**			
Western branches of Canton river, Tai-lung channel	1 50	6½	
Western branches of Canton river, Junction channel	2 0	6½	5½
China, South-east Coast.			
Gaalong bay Hainan Island,		4–5	
Yu-lin-kan bay	9 5	2½	
Hainan bluff	10 35	6	4
Hoi-How	7 0?	6–10	
Cape Cami	2 45? PM summer	9½?	7?
	AM winter.		
Pak-Hoi	5 10?	14?	11?
Song-Ka river	5 0?	6 11	
Lacht-Kuen ——		7 9	
Voung-han bay	9 30	2–4?	
Nau-chau passage	10 20?	12½?	8?
Tien-pak harbour	noon	8½	
Hui-ling-san	8 30	7½	
Namo harbour	10 0	7½	
East Coast of China.			
Ladrone islands (Boddam cove)	9 40	4½	
*Hongkong road	10 15?	7?	
Ninepin group	10 0	5	
Tide Cove (Mirs bay)	10 0	6½	
Tuni-ang island (Bias bay)	8 0		
Tsang-chau island „	8 30		
Hong-hai bay	10 0	6½	
Kin-siang point (Hie-che-chin bay)	7 0	6½	
Chino bay	7 0	6–7	
Cupchi point	7 45	5	4
Hai-mun bay	9 0	6–7	
Good Hope cape	9 0	6½	
Swatow, Double I.	2 15	9	
Clipper road (Namoa island)	11 15	7	
Chauan bay	11 0	6½	

Place.	High Water, Full and Change.	Rise. Springs.	Rise. Neaps.
	h. m.	ft.	ft.
***East Coast of China*—cont.**			
Tongsang harbour	11 30	12	
Chimney island (Rees pass)	11 30	12	
Hut island	0 20	14	
Amoy, inner harbour	noon	18½	14½
„ Chiang-chin, West river	3 40		
Hu-i-tau bay	0 15	16	
Chimmo bay	10 20	16	
Chinchu harbour	0 25	17	
Meichen sound	0 30	17	
Hungwha channel	11 25	23	
Haitan strait	11 15	18–23	14–16
White Dog islands	9 0	18	
River Min, Temple point	10 45	19	14½
„ Losing island	noon	17	14½
Changchi island	9 30	17	
Spider island	10 0	17	
Lishan bay	10 15	16	
Nam-quan harbour	10 0	17	
Namki islands	8 30	17	
Pih-ki-shan island	8 30	17	
Fong-whang group (Bullock harbour)	8 30	17	
Wan-chu river, entrance	9 53?	22	
„ Snipe island	10 15?	22½	
Chin-ki island	9 20	13	
Tai-chow islands	9 0	14	
St. George island (Sanmun bay)	10 20	15	
Kwesan islands	9 30	14	
Nimrod sound	10 30	20	
Chusan Archipelago.			
Vernon channel	9 40	14	
Ting-hai harbour	11 0	12	9
Poo-too island	8 15	12	
Lansew bay	10 0	13	
Volcano island	11 30	15	
East Saddle island	11 0	14	
Yung river, Chin-hai	11 20	12½	
„ Ning-po	1 0	9	

* The range of tide is subject to a large diurnal inequality, and is also affected by the winds which may increase or diminish the range by one foot or more. From October to March, the night tides rise the highest. From April to September, the day tides are the highest. The highest night tides (which occur between October and January) rise about one foot higher than the highest day tides (which occur from May to September).

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Tide Table for the Coasts of China, Formosa, &c.—*continued.*

Place.	High Water, Full and Change.	Rise. Springs.	Rise. Neaps.
	h. m.	ft.	ft.
***Chusan Archipelago*—cont.**			
Hang-chu bay, Seshan islands	11 45	14	
„ Fog islands	11 45	17	
„ Chapu road	noon	25	
„ off Can-pu		32	
Yangtse Kiang.			
Gutzlaff island	11 30	15	
Shaweishan island	11 22	14	9½
Tungsha Light vessel	11 36	14	10½
Wusung R. entrance	0 40	12-15	8-10
„ Shanghai*	1 30	10	7
Langshan crossing†	1 40	12	8
Ching-kiang	8 30	15-18	
Nanking, summer rise	11 0?	42	
Kiukiang „	- -	24-40	
Hankow „	- -	38-50	
Yellow Sea.			
Wang-kia-tai bay	6 0	12	9
Kyau chau bay	5 0	12	9
Ching-tau bay	6 0	12	9
Lo-shan-kau	4 30	11	9
Tsing-hai bay	3 0	9	7
Staunton island	1 30	8	5½
Wangkia bay	2 30	9	7
Shih-tau bay	1 30	9	7
Sang-tau bay	0 55	7	4½
Aylen bay	2 30	6	4
Litau bay	3 0	6	4
Shantung promontory	4 0		
Wei-hai-wei harbour	9 30	9	
Lung-mun harbour	10 0	7	
Chi-fu harbour	10 34	8	6½
Hope sound (Miautau group)	10 24	6½	
Depôt bay (do.)	10 35	6	
Charybdis harbour	10 30	9	

Place.	High Water, Full and Change.	Rise. Springs.	Rise. Neaps.
	h. m.	ft.	ft.
***Yellow Sea*—cont.**			
Korea South coast	9 30	11½	8½
„ Basil bay	4 15	18	10
„ Majoribanks harbour	3 30?	29	
„ Seoul river, Po teu-nai	7 20	16½?	
Korea, Boisee island	5 20	37	16-27
„ Ta Tong river	6 30	13	
„ Chodo island	6 20	12	
„ Ping Yang inlet	7 45	21	14
Port Hamilton	8 30	11	
Thornton haven	9 30	12	8
Chang-zu island	9 30	12	8
Kwang-lo island	9 55	12	8
Ta-lien-whan bay	10 40	11	7
Encounter rock	10 44	11	8
Gulf of Pe-chili.			
Ta-tsing Ho, or Yellow river	4 10	10½	8
Chi Ho	4 0	10½	8
Pei Ho entrance‡	3 30	10	7½
„ Tientsin	7 0	4½	
Peh-tang Ho	3 0	9	7½
Sha-lui-tien banks, west part	2 50	10	8
Ching Ho	1 20	6½	
Gulf of Liau-tung.			
Lau-mu Ho	1 30	5	
Tai-cho Ho	0 15	6	
Yang Ho	0 15	6	
Ning-hai	noon	6	
Sand point	4 50	7	5½
N.W. Head of gulf	5 30	10	8½
Society bay (Sulivan bay)	0 15	8	
Port Adams (Mary island)	2 0	10	
Hulu Shan bay	2 30	8	6
Vansittart Saddle	4 20	10	8½
Liau Ho, The Bar	4 0	11½	7½
„ Yin-koa	5 0	12	

* From tidal observations made at Shanghai by the engineer to the Customs for the last six months of 1872, the night tides in July and in the following three months, average considerably higher than the day tides. The reverse occurs in the months of November and December.

† At the Langshan crossing, the tide rises for 3 hours only, and falls for 9 hours. 1861.

‡ Above Nanking, the rise is that of the freshets, above the winter, or lowest level of the river.

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TABLE OF POSITIONS

ON THE

COASTS OF CHINA AND OFF-LYING ISLANDS; NORTH COAST OF LUZON; BASHEE CHANNEL; FORMOSA AND ADJACENT ISLANDS; THE YELLOW SEA; AND THE GULFS OF PE-CHILI AND LIAU-TUNG.

Place.	Particular Spot.	Latitude, North.	Longitude, East.
	CHINA, EAST COAST.		
Macao	Fort San Francisco	22 11 24	113 33 32
Hongkong*	Cathedral	22 16 52	114 9 31
Raleigh rock	-	22 2 0	113 47 0
Gap rock	-	21 49 0	113 56 25
Lema head	-	22 3 40	114 19 25
Ninepin rock	-	22 15 45	114 22 7
Single island	East summit	22 24 6	114 39 12
Tuni-ang island	Summit	22 27 6	114 36 45
Mendoza island	"	22 30 42	114 50 0
Pedro Blancho rock	"	22 18 30	115 6 54
Pauk Piah rock	"	22 32 54	115 1 0
Chino peak	"	22 44 24	115 47 30
Cupchi point	Hill on it	22 48 7	116 4 26
Breaker point	Light House	22 56 10	116 28 0
Good Hope Cape	"	23 14 35	116 48 31
Swatau	Light-house on Sugar-loaf island.	23 19 54	116 45 32
Brothers islets	South-east islet	23 32 30	117 42 0
Tongsang harbour	Fall peak	23 47 15	117 36 48
Knob rock	-	23 55 40	117 52 10
Chapel island	Light on summit	24 10 18	118 13 30
Amoy*	Signal staff on Ku-lang-seu island.	24 26 45	118 4 3
High Lamock	Light	23 15 0	117 17 30
Dodd island	Light House	24 26 0	118 29 30
Chin-chu harbour	Pisai island	24 49 13	118 41 0
Pyramid point	-	24 52 20	118 57 10
Sorrel rock	-	25 2 0	119 9 0
Ockseu island	Light House	24 58 50	119 26 5
Lam-yit island	High cone peak	25 12 0	119 32 52
Hungwha channel	Sentry island	25 16 30	119 42 52
Haitan Strait	Station island	25 25 16	119 42 22
Hai-tan island	Kiangshan peak	25 36 18	119 49 15
Turnabout island	Light House	25 25 40	119 57 0
Pescadores islands	Fisher island, light on S.W. extremity.	23 33 0	119 28 0
" Makung harbour	Observatory point (the second point on north side of harbour).	23 32 12	119 33 26
White Dogs islands	Light on Middle Dog	25 57 50	120 0 15

* Telegraphic determination of longitudes in Japan, China, and the East Indies, by Lieutenant Commander Green, U.S.N., and Assistants, Bureau of Navigation, Navy Department, Washington, 1883.

Note.—Previously to the telegraphic determination of longitudes, Wellington Battery, Hongkong, now demolished, was considered to be in longitude 114° 10′ 2″ E. (Belcher), and Point Albert (now obliterated by the improvements of Hongkong) in longitude 114° 10′ 49″ E.

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Place.	Particular Spot.	Latitude, North.	Longitude, East.
CHINA, EAST COAST.—*cont.*			
River Min	Temple point	26 8 26	119 37 42
Alligator island	Summit	26 9 0	120 24 30
Tung-ying island	Peak	26 23 12	120 29 40
Cony island	Summit	26 29 40	120 8 30
Double Peak island	Highest peak	26 36 0	120 9 45
Pih-seang islands	Town island	26 42 15	120 20 30
Dangerous rock	Summit	26 52 10	120 33 10
Tae islands	Easternmost	26 59 0	120 42 0
Ping fong island	Summit	27 9 42	120 31 0
Pih-quan peak	Summit	27 18 30	120 27 0
Nam-quam harbour	Bate island	27 9 10	120 24 15
Port Namki	Eastern horn	27 26 10	121 5 20
Pih-ki-shan island	Summit	27 37 25	121 11 15
Fong-whang group	Coin island	27 50 0	121 14 20
Snipe island	Custom House Flag Staff	27 58 20	120 45 9
Pe-shan island	Summit	28 5 30	121 30 0
Soudan islet	„	28 15 45	121 42 30
Chikhok island	„	28 22 15	121 42 0
Tai-chau group	Hea-chu islet	28 23 0	121 53 20
Chuh-seu island	Summit	28 40 30	121 45 50
Tung-chuh island	„	28 42 12	121 54 30
Hieshan island	Southernmost	28 50 48	122 13 0
Montagu island	North-east point	29 10 15	122 4 0
Kweshan islands	Patahecock	29 22 10	122 13 30
Mouse rock	Summit	29 31 30	122 13 30
Buffalo Nose island	High part	29 36 12	122 1 40
Nimrod sound	Middle island	29 34 20	121 43 15
CHUSAN ARCHIPELAGO.			
Tongting islet	Summit	29 51 30	122 35 20
Chukea island	Peak	29 54 0	122 25 18
Just-in-the-way islet	Summit	29 57 42	121 54 30
Chusan island	Observation spot, Ting-hai harbour.	30 0 25	122 5 18
West Volcano island	Light on summit	30 20 25	121 51 45
Yung river	Chin-hai citadel	29 57 8	121 43 6
„	Square island light	29 59 30	121 46 10
„	Pas-yew light	29 58 0	121 44 45
Chapu	Battery	29 35 30	121 5 45
Video island	Summit	30 8 0	122 46 30
Barren isles	Centre	30 45 0	123 8 30
Saddle group	North island	30 52 0	122 40 20
Cairnsmore rock		30 43 40	122 34 8
YANGTSE KIANG.			
Shaweishan island	Light on summit	31 25 25	122 13 45
Gutzlaff island	„ „	30 48 35	122 10 0
Entrance of river	Tungsha bank light vessel	31 8 6	122 0 15
Wusung river	Fort A. at entrance	31 23 30	121 29 42
SHANGHAI*	British Consulate flag-staff	31 14 41	121 28 54
Hankau	Mouth of Han river	30 32 51	114 19 55
YELLOW SEA.			
Yellow river	Southern entrance	34 2 0	120 10 0
Wang-kia-tai bay	Lung-wang temple	35 39 0	119 51 30
Staunton island	Landing place on north side.	36 45 29	122 16 19
Shan-tung promontory	Light House	37 24 0	122 42 15
Chi-fu or Yen-tai harbour.	Chifu Cape, Observation spot.	37 36 0	121 26 21
Miau-tau group	Peak of Northern island	38 23 37	120 55 0
„	Hope Sound, Observation spot.	37 56 0	120 40 42
Ta-lien-hwan bay	Observation spot on isthmus on south Sanshan island.	38 52 38	121 51 30
Thornton Haven	Observation spot on chart	39 4 0	123 10 5
Round island	Summit	38 40 0	122 11 30
Liau-ti-shan promontory	S.W. point	38 43 0	121 8 0

* Telegraphic determination of longitudes, Bureau of Navigation. Navy Department, Washington, 1883.

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Place.	Particular Spot.	Latitude, North.	Longitude, East.
GULFS OF PE-CHILI AND LIAU-TUNG.			
Pei Ho, South Taku fort	South Cavalier	38 58 16	117 42 48
„ Tientsin	Observation spot on chart	39 9 0	117 11 25
Shaluitien island	Jose house	38 56 0	118 33 0
Great wall	Abutment on the sea	39 58 0	119 49 30
Liau Ho	Yingtze pagoda	40 43 12	122 14 14
Hulu Shan bay	Observation place (north side).	39 30 46	121 17 34
Port Adams	Entry island	39 16 0	121 35 30
ISLANDS EASTWARD OF THE COAST OF CHINA.			
Pratas island	North-east part	20 42 3	116 43 14
Balintang islands	Centre of group	19 58 0	122 14 0
Batan group	Islet off south-west point of Y'Ami island.	21 4 56	121 58 24
Gadd rock		21 43 10	121 37 0
Vele Rete rocks		21 45 30	120 48 40
Botel-Tobago sima	South extreme	22 1 0	121 34 30
Little Tobago sima		21 58 0	121 35 30
Formosa island	South cape lighthouse	21 55 0	120 50 0
„	Taku, Saracen head	22 36 14	120 16 33
„	Port Heongsan	24 46 0	120 55 0
„	Tam-sui harbour, White fort.	25 10 18	121 25 31
„	Foki point	25 18 30	121 34 45
„	Ke-lung harbour (Observation spot).	25 8 25	121 45 30
„	Sau-o bay (Observation spot).	24 35 28	121 49 27
Samasana island		22 40 0	121 28 0
Raleigh rock		25 55 0	124 33 0
Hoa-pin-su island	North face	25 47 7	123 28 0
Meiaco-sima group	Kumi island (north beach)	24 26 0	123 0 0
„	Broughton bay (landing place).	24 21 30	124 14 0
„	Port Haddington (Hamilton point).	24 25 0	124 6 40
	Tai-pin-san (south-west bay).	24 43 35	125 19 20

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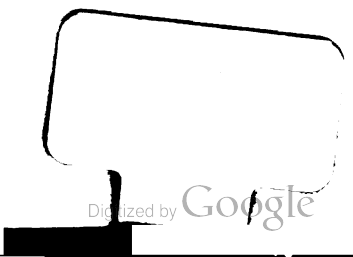

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